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The Contribution of a New Town Enviroment to Educational
Attainment among Primary School Children in Glenrothes

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A thesis presented for the degree of Doctor of Philosophy
in the Faculty of Social Sciences at the University of Edinburgh

1976



Declaration of Authorship

I , Carl Albert James , declare that I am the sole author of this
thesis

17th August 1976.

Abstract

The evolution of the New Towns Policy is considered and among its many goals an emphasis was placed on the improved quality of life to gained by residents of New Towns ,and the more equal distribution of life chances , compared to older areas , to be found among their populations. This thesis investigates the unsubstantiated assertion that New Town children perform better at school than those in the country at large, with regard to these two broad objectives of New Town Policy.

The major determinants of educational attainment are reviewed and hypotheses are drawn up in order to evaluate whether or not New Town children do have higher educational attainments than children from a comparable area, and whether or not social differences in educational attainment are as great in the New Town as in the comparison area.

Upon analysing attainment test data for several hundred primary school children and attitude survey results from their parents, the hypotheses postulating higher attainment and smaller social differences in educational attainment for the New Town children are corroborated.

Possible explanations for these phenomena are then investigated on the basis of further hypotheses and a model drawn up on the basis of the results. Parental attitudes and not home amenities are found to be significantly different in the New Town from the comparison area, and it is indicated that the New Town's immigrant population may have arrived in the town with a somewhat different range of attitudes from those of the comparison population , thus accounting for some of the educational differences.

However, educational attainment is also found to correlate with length of residence in the New Town , although not beyond seven years, thus indicating that the New Town environment may also have contributed to the children's advantage in educational attainment.

Preface

In 1972, when this investigation was conceived, the third generation of British New Towns was under construction and over 150,000 children were attending schools in New Towns. Whilst several investigations of New Towns have been carried out, none has yielded any empirical evidence as to either the overall educational attainments of New Town Children or the effects of a New Town Environment on educational attainment.

However, the early 'seventies' witnessed the publication of much material on education and educational attainment on both sides of the Atlantic following the 'Headstart' projects in the U.S.A. and the Plowden recommendations in the U.K. The results of research into these and other educational fields provided a body of knowledge upon which an investigation into the effects of a New Town Environment on Educational Attainment could be based.

Apart from the numerous writers and researchers who have provided this basis for the thesis, my first acknowledgements must go to Dr.H.Wirz and Mr.M.Adler of the Department of Social Administration, who have advised me throughout the entire project and who have read and re-read the work in its many stages of completion.

I am also indebted for advice, assistance and information to officers in the Departments of Educational and Social Work of Rife Region and in the Departments of Planning and Housing of Glenrothes Development Corporation. The 13 teachers of all the 13 schools visited gave their fullest co-operation and this made the research possible. This was also true of ~~Mid~~ Lothian Education Department

and headteachers in Livingston who enabled the successful completion of the pilot survey. I must also thank members of the Computer Advice Centre at Edinburgh University for their help and advice during the data analysis.

Finally, I must express my gratitude to the parents and children of Fife who returned the questionnaires, on which the major part of this work is based.

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CHAPTER ONE

The Evolution of the New Towns Policy

In 1946, The New Towns Act was passed. It followed almost half a century of agitation for such action and a much longer history of campaigns for urban improvement. The Town and Country Planning Association had led campaigns ever since its inception in 1899, shortly after the publication of 'Tomorrow; A Peaceful Path to Social Reform.' by Ebenezer Howard. As early as 1920, a government report² recommended the setting up of New Towns to relieve the congestion in London. In the Marley Report³ of 1935, and in the Minority Report of the Barlow Commission⁴ in 1938 further recommendations followed. Yet no action was taken. In the earlier inter-war years the political will was lacking, and the exigencies of war delayed any possible action on the later reports. During the war, however, preparations for the future were made. The Uthwatt⁵ and Scott Committees⁶ were set up and reported in 1942, and in 1943 the Ministry of Town and Country Planning was set up. At the same time plans for the future development of London were drawn up; the second⁷ of these projected the setting up of New Towns to house over half a million Londoners displaced by redevelopment. The need for New Towns had been well established before the New Towns Committee⁸ was set up by Lewis Silkin in 1945.

Those who campaigned for New Towns largely used the indignity of urban deprivation as their main argument. Howard, himself, quoted Ruskin's 'Sesame and Lilies':

"Thorough sanitary and remedial action in the houses that we have and then the building of more, strongly, beautifully, and in groups of limited extent; kept in proportion to their streams and walled around, so that there may be no festering and wretched suburb anywhere, but clean and busy street within and the open country without; with a belt of beautiful garden and orchard round the walls, so that from any part of the city perfectly fresh air and grass and

sight of far horizon might be reachable in a few minutes walk. This the final aim." ⁹

Howard stated as self evident that the herding of people into concentrated towns and cities was bad, later protagonists used more concrete evidence. Two of the more prominent were Gilbert and Elizabeth McAllister, who organised many activities for the Town and Country Planning Association between 1937 and 1947, and together they published in 1941 a book with the innocuous title of 'Town and Country Planning'. ¹⁰ The book summed up many of the arguments and thoughts of the planning enthusiasts and more importantly those of the politicians who later enacted the legislation and the public who put them into Office

The McAllisters begin with a bold statement: "There is, nevertheless, not sufficient recognition that the only way to a nation of men, women and children as fit as possible, as intelligent as possible, as happy as possible and as morally sound as possible is through the creation of the right environment, and there are, moreover, some simple, if dramatic, steps which the community as a whole might take which would result in a tremendous advance towards this ideal." ¹¹ They support this with simple statistical information, first on infant mortality; the rates in 1938 being 103 per 1,000 in Glasgow, 80 in Newcastle, 71 in Manchester, 33 in Letchworth and 25 in Welwyn (the latter two are the earliest New Towns), ¹² secondly on T.B. rates for the same year 1.2 per 1,000 in both Newcastle and Liverpool, 1.1 in Glasgow, 0.88 in Edinburgh, 0.57 in Welwyn and 0.38 in Letchworth, ¹³ they then go through much other evidence treated in a similar manner and conclude with a comparison of Finsbury and Lewisham:

Table 1.1. Scholarships and Overcrowding in London in 1938 *

	Finsbury	Lewisham
Scholarships per 1,000 children	1.2	8.1
Percentage of population living more than two to a room.	29.4	4.1

* McAllister, op.cit.p.11.

Such arguments are about the redistribution of life chances. They do not argue for the better situated to have their chances of good health and education to be taken away, but they do argue for a new distribution of the benefits of living, where the least well endowed will be much closer to the most well endowed. They aim to raise the minimum levels of existence. The New Town concept implicitly carried with it a redistribution of life chances, which aim had inspired the movement and had been the main weapon in the propaganda for New Towns.

The atmosphere of the war years gave these views greater credence than ever before. Titmus ¹⁴ has drawn attention to the egalitarian implications of total war and Arthur Marwick ¹⁵ has written several books concerned with the subject, drawing similar lessons. Stanislaw Andrzejewski ¹⁶ has formulated a concept called the 'Military Participation Ratio' from which he concluded that mass war tends to level social differences. The concern for reconstruction was prominent throughout the war, the need to have something to fight for as well as against was evident at the clamorous reception given to the Beveridge Report, ¹⁷ which among its many recommendations urged good town and country planning after the war.

The destruction of the German bombing campaign on Britain inevitably stimulated interest in reconstruction. A member of the war cabinet, Arthur Greenwood, was appointed as Chairman of the Ministerial Committee on reconstruction problems. The obvious need

for reconstruction, together with the social climate of the time were two spurs to the further investigation of planning, itself a major wartime innovation.

Largely at Ernest Berin's initiative, Lord Reith was moved to take charge of the Ministry of Works and asked to concern himself with the physical aspects of post war reconstruction and planning. In 1941 he set up the Uthwatt Committee to look into the public acquisition of land for reconstruction, and the Scott Committee to look at rural land utilisation. In 1943 the Ministry of Town and Country Planning was established.

At the end of the war, there was general social pressure for improved reconstruction. All the political parties agreed on this. However the 1945 General Election brought in the first majority Labour Government and Lewis Silkin as Minister of Town and Country Planning. In 1945 he appointed the New Towns Committee with Lord Reith as Chairman, and the following terms of reference:

"To consider the general questions of the establishment, development, organisation and administration that will arise in the development of New Towns in furtherance of a policy of planned decentralisation from congested urban areas; and in accordance therewith to suggest guiding principles on which such Towns should be established and developed as self-contained and balanced communities for work and living".¹⁸

The Committee reported the following year. The Report contained many recommendations about environmental and planning standards. A Public Corporation was to take over the site and supervise the planning of each of a number of New Towns. Amongst the aims of each Corporation were the creation of a balanced Social Structure, with the avoidance of segregation into one class neighbourhoods; the design of dwellings to meet the needs of the entire population, including families, single people and the elderly; the provision of

multi-purpose meeting places and larger amenities of all sorts; and the provision of adequate space for the construction of schools and for recreation. These objectives were to be integrated with the provision of employment, shopping, health care and other services in the planning process.

The New Towns Act was passed in 1946 and before the Labour Government passed out of office in 1951, 14 New Towns were under construction. Osborn and Whitrick have commented on this in praising the Minister himself,

"In all probability any government coming into office at that time, in view of the official and party acceptance of the Barlow Thesis, would have ventured on one or two New Towns as a concession to minority pressure groups. But Silkin did more than that. His New Towns Act of 1946 generalised the proposal in a much more thoroughgoing way than could have been expected, and together with the great Town and Country Planning Act of 1947 created a system of land use control and a machinery for positive town construction that was completely revolutionary." 19

Although Silkin's personal inclinations and abilities may have had a decisive role in the direction of planning policy,²⁰ the legislation is in many ways typical of that of the government of the day and should be seen in that context. It was bold, as was the formation of the National Health Service, the public ownership of major utilities, the implementation of the Beveridge Report and the final abolition of the Poor Law, and the proclamation of independence for the Indian subcontinent. This boldness came from five years experience in the most powerfully directive government of Modern Britain and from having the wartime powers still in operation. It also came from a population which clearly wanted a better land in which to live.

The legislation was also redistributive, Like the Health, Social Security, Housing and Education programmes, it was designed to ensure a minimum and adequate standard of life for all those in the community and, as such it aimed at redistributing life chances. Even if the higher echelons of society remained untouched, the bottom would be raised, thus making the difference less. In this design, it became one of the pillars of the Welfare State. It is in this context that it must be judged.

The New Towns to be constructed were to be socially as well as physically planned. Employment, schools and educational facilities, shopping facilities, health care, religious institutions, and general social and entertainments facilities were to be provided in an appropriate and planned manner. However the towns were also to be balanced communities. The Reith Report spelt out its definition of the term 'balanced community' at some length: "So far as the issue is an economic one, balance can be attained by giving opportunity to many sorts of employment which will attract men and women up to a high income level. Beyond that point the problem is not economic at all nor even vaguely a social one; it is, to be frank, one of class distinction. So far as these distinctions are based on income, taxation and high costs of living are reducing them. We realise also that there are some who would have us ignore their existence. But the problem remains and must be faced; if the community is to be truly balanced, so long as social classes exist, all must be represented in it. A contribution is needed from every type and class of person; the community will be the poorer if all are not there, able and willing to make it." ²¹

The report went on to further emphasise the social policy objectives of the New Towns. Although it accepted the desirability of creating a 'socially homogeneous community'²² and stated that a more deliberate and consciously thought out policy would be necessary that just locating individuals of different social backgrounds in the same neighbourhoods, the report nowhere specified this policy. It stated that 'there is need for much more thought and study on this subject.'²³

Although social balance was not considered a sufficient condition for creating a more egalitarian community in the New Towns, it was considered of considerable importance.²⁴ The history of the application of this policy sheds considerable light on the evolution of New Towns through the last thirty years.

Initially the idea of 'pepper potting' was practiced in a few towns. This was done so that people of considerable different occupations would live next door to one another. This was neither popular nor successful and was speedily discontinued. The established tendency of those of grossly dissimilar backgrounds to move away from one another prevailed in New Towns, as elsewhere in the United Kingdom.²⁵ In many towns this was not tried and an attempt was made to mix groups of houses sharing the same neighbourhood facilities. This procedure has had considerably more success in retaining different social groups in the same geographical neighbourhood. However the use of the term neighbourhood in other than a geographical sense becomes more dubious.²⁶

However, such integration is at the mercy of the incoming sources of employment. Heraud has demonstrated this in his analysis

of the development of Crawley.²⁷ In the early years manufacturing industry was set up and the prime requirement then was for industrial workers. In its later development more white collar jobs were available and people coming to the town then were allocated houses in the newer neighbourhoods. Heraud also noted a substantial internal migration, especially from subsidised to unsubsidised dwellings, and a significant emigration of those in Social Classes I and II to the surrounding countryside. The Development Corporation's policy of siting unsubsidised dwellings and dwellings for sale also helped this segregation. The result was that the proportion of those in Social Class I ranged from 1.4% to 8.1% through the neighbourhoods, producing an inner ring of predominantly working class housing, surrounded by newer more middle class housing. This type of development is fairly typical.

The abandonment of the goal of 'social balance' in the planned neighbourhoods of a New Town coincided with a growing weight of evidence that neighbourhoods, as defined by those who lived in them, i.e. as social entities, could not be planned. In the towns of the 1940s the neighbourhood was the planners building block. The Reith Report recommended them to be planned with identifiable neighbourhood facilities and hence a neighbourhood identity.²⁸ Often these neighbourhoods were based on the population necessary to support a two class entry primary school. The Radburn pattern of road construction was also frequently followed so that all dwellings, shops and schools could be reached without crossing a road. Although such a concept is of undoubted use in terms of physical planning, "under present conditions contacts with other people, and ties with other areas, are so widespread that

neighbourhoods do not readily develop from neighbourhood units.

Therefore the intention of inculcating neighbourhood characteristics in a New Town is of little value if based on the premise that neighbourhoods will develop similar to those in urban communities which have grown as a result of social and economic pressures in a heterogeneous population." ²⁹

Whilst the basic planning unit of the earlier New Towns has been found to be deficient in many respects, and hence has been superseded, ³⁰ the Towns themselves have aimed at being 'socially balanced'. In this they have been handicapped by the technological developments of postwar industry, on which, they have depended for their growth. In the new and expanding industries the proportion of unskilled jobs is diminishing. This results in an under-representation of these categories of workpeople in New Towns. Heraud comments that New Towns are thus populated by 'industrial labour selection'. ³¹ Lloyd Rodwin ³² noted that the cost of moving to a New Town could dissuade those on low incomes, and also that rents for new houses, even in Scotland, may be a disincentive. Housing officials also attempt to minimise the number of 'undesirable' tenants which they accept. All these factors lead to an under-representation of social classes IV and V amongst New Town residents. (see table 1.2).

The original fear of those proposing New Towns was not an underrepresentation of Social Classes IV and V, but of Social Classes I and II. ³³ This was because of the observed tendency for those in such social classes to buy their own homes, which are usually more expensive than the average and frequently in somewhat exclusive suburbs or in the country. ³⁴ This phenomenon persists in New Towns but does not denude them of professional and managerial inhabitants,

partly because of the special housing provision made for them, and partly because of the youth of New Town residents. Many of those in professional and executive occupations have not achieved any great seniority and hence the income which is necessary for house purchasing of the more expensive type.

Apart from a slight underrepresentation of unskilled workers, New Towns are a remarkable reflection of the occupational balance in the United Kingdom.

Table 1.2

A Comparison of the Social Structure of the
London New Towns with England and Wales

	<u>England & Wales</u>	<u>London New Towns</u>
	%	%
Employers and Managers	10.1	9.1
Professional Workers	4.6	7.0
Intermediate Non-Manual	4.5	6.2
Junior Non-Manual	12.7	13.5
Foreman & Supervisory Manual	3.6	4.5
Skilled Manual	31.3	33.5
Semi-Skilled Manual	14.9	16.3
Unskilled Manual	8.1	5.3
Personal Service & Own Account	4.6	3.8
Farmers, Forces & Undefinite.	5.6	0.8 *

* The absence of farmers and armed forces personnel is to be expected in towns which are not close to military establishments.

Source:

Census of England and Wales 1966, cited in Schaffer.F.

"The New Town Story" Paladin 1972.p.186.

Although New Towns have remained fairly well ' socially balanced ' communities, they have also demonstrated tendencies towards internal social differentiation. Wirz ³⁵ notes that there are social differentials in participation in formal social organisations, where those in higher occupational groups are more frequently found in leadership positions. New Towns are no exception to the observation of Professor Burns on the "persistence through time, through migration, and through sizeable changes in incomes, of patterns of behaviour, political affiliation, and way of life generally." ³⁶

However, certain changes have been noted in the behaviour patterns of those people in New Towns. The school building programme in East Kilbride was found to be inadequate in the 1950s because of an unexpected population bulge. Mrs. Judith Hart ³⁷ a junior minister at the Scottish Office concluded that more families were having an extra child in response to their new, more spacious houses, something the cramped conditions of Clydeside tenements mitigated against. The new Towns of England are developing as electoral bastions for the Labour Party, but those of Scotland have shown an early propensity to vote for Nationalist candidates. ³⁸ Willmott ³⁹ in his investigation of East Kilbridge and Stevenage noted a diminution of class differences on some social activities.

There are now over one million people living in New Towns. The development of these towns has partly fulfilled expectations and partly dashed them. There have also been some unexpected developments. They are highly interesting experiments. Their success in terms of social policy needs evaluating.

The 1945 Labour Government intended to develop 20 New Towns. During its term of office 14 were designated, eight near London

and two in Scotland; East Kilbride and Glenrothes. However major construction began on these towns only in the 'fifties'. One more New Town was designated before 1960; Cumbernauld, in 1956.

Of these 15 towns, 10⁴⁰ were to take population primarily from a major city, London in eight cases and Glasgow in two. These ten are significantly larger than the other five which were to provide adequate social development in relation to an existing or projected industrial base. Glenrothes and Peterlee were based upon employment provided by coalmining. These five were not excluded from overspill arrangements, and Glenrothes received a considerable population from Glasgow.

In the 'sixties' a second generation of New Towns were designated, and these have been followed by a third. The number of New Towns in Scotland is now six. These second and third generation towns transgress some of Howard's and Reith's recommendations, especially with respect to size.⁴¹ However the motivations of the early postwar years were still present. The relief of congestion in the conurbations was still a prime factor and overspill still provided the bulk of the projected inhabitants. Liverpool, Birmingham and Tyneside now have their satellites⁴² along with London and Glasgow.

It is now thirty years since the passing of the New Towns Act and some indicators of the success or failure of the New Towns are available. The comments of authorities are contradictory. Donnison writes; "By far the largest statements of housing and planning in England can be seen in the New Towns. These, along with several large scale Swedish experiments, are the most important architectural and urban developments in Europe."⁴³ Thomas Blair concludes a not overcritical review with some disquieting words:

Too many British New Towns have failed to overcome the depressing aspects of large-scale government sponsored settlements. Town centres lacking in character and excitement, dim barren subways under roads, the sameness and uniformity of streets and housing, the large unused communal spaces and townscapes which dribble away into uninteresting horizons, all give the impression of a vast sub-topian sprawal." ⁴⁴

The aesthetic qualities of a New Town generate opposite judgements, even amongst experts, and are not easily resolved by an empirical approach. However this is not the case in other fields. The very problems highlighted by the protagonists of New Towns, such as health and crime, can be subjected to empirical investigation.

There are a variety of fields where this approach can be used, for example:

- (i) Housing: Based upon an assessment with regard to Parker Morris standards and average standards of post 1945 constructions, the differences between rented and owner occupied dwellings, the level of overcrowding and the degree of housing satisfaction.
- (ii) Amenities & Social Activities: With regard to provision of shops, clubs, entertainments, and facilities for social organisations, and open space and playing fields of the standards of such bodies as the Playing Fields Association.
- (iii) Health: With regard to the provision of hospitals, and doctors, and incidence and distribution of illness, including mental illness.
- (iv) Crime and Vandalism: With regard to police provision and the incidence of offences.

- (v) Social Security and the Social Services: With regard to the take up of these services, considering the special distribution of a New Towns population.
- (vi) Employment: With regard to the distribution of skills in the workforce , as well as the degree of unemployment, and the proportion of commuting, indicating the degree of sufficiency of employment.
- (vii) Education: With regard to the level of provision, including nursery and post school facilities, and the structure of attainment.

The above list is not exhaustive, but the factors included were prominent either in the 1946 Act itself, the Reith Report, or are intrinsically bound up with the movement for New Towns Legislation.

It is necessary to assess the results of such investigations with regard to both the level of the characteristic (e.g. housing, health or crime etc) in comparison to national figures and those for alternative contemporary schemes, and its social distribution. The ideology behind the New Towns movement and its achievements is both one of improvement for the whole population, and one of redistribution of life chances to those at the foot of the social ladder.

Of the seven areas specified, there is data available to throw light on all of them.

(i) Housing:

All the dwellings built in New Towns by the Development Corporation should fulfil minimum government recommendations, as should all local authority housing built during this period. However, when the then Ministry of Health re-instituted the pre-war

system of housing awards, the entries from development corporations gained a higher number of awards than those of private enterprise and local authority construction combined.⁴⁵ In the 1967 competition for the 'perfect family house costing no more than £3,750 excluding the site,' the first two awards went to New Town architects.⁴⁶

Whilst the housing built by development corporations is of a high design standards, there is no evidence that houses built by speculative builders in the New Towns are of a particularly higher standard than elsewhere,⁴⁷ about which Professor Simey has commented; 'Most of the designs of the speculative builder are dreadful beyond belief'⁴⁸ and which Kidder Smith has described as 'universally ghastly'.⁴⁹ However a lower proportion of houses built in New Towns are by speculative builders, than in the country as a whole.

Consistent amongst evaluations of housing satisfaction is the desire for low rise dwellings, especially houses, as opposed to flats and high rise dwellings. An early post war study indicated that 19 out of 20 people preferred to live in a house as opposed to a flat.⁵⁰ There is no indication that this has changed. A recent study of a council estate in Glasgow revealed that, even amongst the traditionally tenement dwellers of Glasgow, house dwellers were most satisfied with their accomodation.⁵¹ New Towns have constructed a much lower proportion of flats than most local authorities. Whilst the proportion of flats being built by local authorities increased from around 12% in 1950 to 53% in 1966,⁵² those built in New Towns showed no similar increase, Crawley reduced its projected proportion of flat dwellers from 15% at designation to 2½% by 1957.⁵³ Other New Towns similarly have found difficulty in letting their flats or

maisonettes; Glenrothes came to an arrangement with the R.A.F. over some of its maisonettes in the early 'seventies'.

Table 1.3. A Comparison of Housing Amenities in Glenrothes with those of Fife and Scotland

	<u>Scotland</u>	<u>Fife</u>	<u>Glenrothes</u>
Percentage of dwellings in multi-dwelling buildings	52	-	13
Average number of persons per room.	0.72	0.77	0.85
Percentage of households lacking sole use of inside hot water	13.5	4.3	0.3
Percentage of households lacking sole use of bath or shower	21.3	8.8	0.5
Percentage of households lacking sole use of an inside flush toilet.	12.5	3.0	0.2

Sources: Censuses of 1966 and 1971 and Glenrothes Household Analysis 1971.

In all respects other than that of persons per room the New Town is advantaged with respect to the national situation. Although Glenrothes had a higher average density of occupation, this indicated a better usage of housing space because whereas 9.8% of dwellings in Glenrothes were overcrowded by Development Corporation Standards, in Scotland as a whole, on a less stringent standard, 9.9% of dwellings were overcrowded and in West Central Scotland this figure was 15.2%.⁵⁴

By all conventional methods of evaluation, the standard of New Town housing is much above the national average.

(ii) General Amenities

In all New Towns, space in excess of that called for the the Playing Fields Association has been provided.⁵⁵ The Reith Report

recommended certain minimum facilities of a multi-purpose nature, for use by the whole community.⁵⁶ Under the Housing Act 1936, Development Corporations have been able to build neighbourhood or local centres as amenities, provided that this cost is recovered from the housing fund.

These powers were incorporated into the 1936 Act, after much criticism that housing authorities had not provided such amenities. Because of the tradition of low rents in Scotland, it has been much more difficult for Scottish local authorities to recover this money, resulting in a lower incidence of provision in Scotland. New Towns North of the border have been similarly affected, until in 1963 the Major Amenity Fund was introduced, which allowed development Corporations to spend £4. per head of target population on 'social equipment'. Because of the remit of the Reith Report and the special Acts of Parliament since introduced, New Towns have regularly developed neighbourhood amenities, such as shops, meeting rooms, a public house and other facilities along with the house-building programme.

The results of a national social survey into leisure activities,⁵⁷ indicate a high level of satisfaction in New Towns. Private gardens were most commonly demanded throughout the country, in New Towns over 90% of households have sole use of a garden in comparison to between 75% and 86% nationally.⁵⁸ More New Town residents were also more satisfied than the national average with amenities for children (60% of New Town Residents were satisfied, compared with 47% nationally),⁵⁹ with general amenities and with open space.⁶⁰ However Sillitoe notes large divergencies in satisfaction with the provision of open space in various New Towns, and questions the differing

effectiveness of planning methods.⁶¹

Although certain local authority developments can rival those in the New Towns in their provision of open space and general amenities, the cost and planning constraints placed upon them, make such cases as the Seacroft development in Leeds, an exception rather than the rule. New Towns have been successful in providing a high level of amenities and although subject to a great deal of variability, have also obtained a high level of satisfaction with the provision.

H. Wirz, in his study of social organisations in three Scottish New Towns noted a high level of participation in them, as well as a large number of such organisations.⁶² However he noted a continuing social bias in both participation and leadership, but concluded "significant progress in the direction of social development has been made in these three Scottish New Towns, thus perhaps taking them nearer to becoming 'essays in civilisation' as the founders of the modern new town idea envisaged them to become."⁶³

(iii) Health

The findings cited by the McAllisters with respect to the first New Towns have been replicated throughout the country. However their population of young, mobile, and hence probably healthy people may mask other trends. The McAllisters cited Wythenshawe, in Manchester, as an example of good planning leading to better health standards, although not as good as Welwyn or Letchworth.⁶⁴ In the 'fifties' work done by Wiseman indicated a number of discrepancies in Wythenshawe's supposedly good health record. The suburb lies at the extreme South of the City of Manchester, outside a belt of traditionally middle class private housing, with a decaying area around the city centre and some

older working class suburbs in the north of the City. "As we go out from this focus (the City Centre), conditions get better; population intensity is reduced, socio-economic level rises, the birth rate and death rate both get smaller, the number of mentally deficient and of T.B. cases falls. The trend is not unbroken, however, and for deaths under one year, and the number of problem families producing officially recognised cases of child neglect in particular, the pattern departs significantly from the general picture." ⁶⁵ Wythenshawe is prominent, although not alone in breaking this trend.

Such discrepancies possibly exist in New Towns, although their overall record is one of good health amongst their inhabitants.

In the field of mental health, much has been written about the phenomenon of 'New Town Blues', ⁶⁶ yet there is no empirical evidence which supports the view that mental health is worse in New Towns than elsewhere. A certain degree of disorientation may accompany the formation of new communities, ⁶⁷ but the better amenities of New Towns should mitigate this in comparison to the situation on new suburban estates.

What evidence does exist on the location of mental illness points to a high incidence in inner-city areas and amongst high-rise flat dwellers. Thomas Blair writes "urban culture produces its own brand of illness - a fact confirmed again by the Mid-Manhattan Survey, an authoritative large scale report by Professor Leo Srole of the distributions of symptoms in an urban population. Frequent emotional upset and mental distress are 'Central City' afflictions, especially among the poor and deprived and among 'status movers' up and down the socio-economic scale." ⁶⁸ In this sentiment he is in the tradition of the Chicago School of the 'twenties', ⁶⁹ in which

much emphasis was laid on the 'social disorganisation' of decaying inner-city areas as a major contributing factor to mental illness.

With the proportion of flats being built by local authorities accounting for about half of new constructions built for renting, flat and high-rise living became a major alternative for many city dwellers, yet "It was found that the morbidity of those families who lived in flats was 57% greater than that of those who lived in houses." ⁷⁰

With these major alternatives, the evidence on health, both mental and physical, condemns the older, urban areas, but not the New Towns. However one major study has investigated health, especially mental health, in a New Town and compared it both with a new Outer London housing estate and with a more established inner urban area.

Lord Taylor and Sidney Chave ⁷¹ conducted a survey in these three areas lasting over three years and investigating admissions to mental hospital, referrals to the psychiatric outpatients department, patients under the care of general practitioners and self-supported nervous symptoms obtained through interviews on a sample survey. They "found no real evidence of 'the suburban neurosis,' nor of what has more recently been described as 'new town blues'." ⁷²

More specifically they found that unlike in the general population there was no increase in the incidence of neurosis from Social Class I to Social Class V in the New Town, ⁷³ and "that in a socially planned community the incidence of psychosis is reduced". ⁷⁴ However this was not the case for sub-clinical neurosis where no significant differences were found. ⁷⁵ Taylor and Chave conclude by stating "Our survey has shown that the creation of a new town, with full social and economic planning, results in an improvement in general health, both subjective and objective." ⁷⁶

(iv) Crime and Vandalism

Information on these activities is not adequate for an appraisal. Washington Development Corporation has recently produced a paper commenting upon the low level of vandalism in the town.⁷⁷ Many other second generation New Towns have also noted this phenomenon, yet these towns have relatively few teenage inhabitants, amongst whom the highest proportion of vandals are found. Cumbernauld Development Corporation has also recently produced evidence of a low proportion of traffic accidents, involving pedestrians within the town, and asserts that this is a result of its pattern of traffic segregation.⁷⁸

There is little evidence of a more systematic nature and so the question can not be resolved.

(v) Social Security and the Social Service

As with health, the take-up of these services is to a large degree determined by the structure of the population. That it is younger and more skilled will indicate a naturally lower demand for Social Security and the Social Services, although the proportion of women of child bearing age in New Towns is high and this will pose an additional demand on the Social Services associated with maternity. Although simple comparisons with national figures reveal an apparent advantage to New Towns, a closer investigation is necessary for firm conclusions to be drawn.

(vi) Employment

Most of the New Towns have been successful in attracting industry and creating other employment opportunities. They have largely maintained a higher than average level of employment, although Corby and Glenrothes in the 'sixties' and Skelmersdale in the 'seventies' have had periods in which unemployment has been high.⁷⁹ Nationally,

it appears that New Towns are the centre for slightly more employment than they have the population to fill, and are attracting commuters from the surrounding area. In December 1967, New Towns provided almost one job for every two residents, a more than adequate figure for towns with very large numbers of children amongst the population.

Such an adequacy of employment has not necessarily led to New Towns being 'self-contained'.⁸⁰ In the London region, a two stage commuter ring appears to be developing. Residents of the eight London New Towns commute into London itself to work, and their places in the New Towns job structures are taken by others commuting in from as far out again.⁸¹ A similar situation can be observed in Redditch with respect to Birmingham. The developments of the New Towns are to a large degree determined by unplanned regional and national trends. In some New Towns, this situation is, in fact, planned for, and Washington, which lies between the Tyne and the Wear, expects to have large scale commuting both in and out of the town, although the concept of self-sufficiency in employment is retained, i.e. that there will remain a balance between employment in the town and workers living there.

The relatively small proportion of unskilled workers may mask certain factors about unemployment, for the rate of unemployment for unskilled workers is four times the national average.⁸²

An evaluation of New Towns on the criterion of employment yields a basically positive appraisal, with some areas of doubt, concerning employment structure, especially with regard to unskilled workers, and the increasing level of commuting.

(vii) Education

In examining the other six areas of activity, the performance of the New Towns bears up well under the light of what evidence exists, although there is the common tendency for the New Towns to be flattered by what figures do exist, because of their population structure, which is much younger than the national average, and also slightly more skilled. This situation is replicated with regard to education.

The schools in New Towns are of a high standard. They follow the recommendations of the Reith Report on open space⁸³ and hence enjoy many advantages over inner-city schools. The staff tends to be young and adopt 'progressive' teaching methods, however they conversely lack experience. With regard to the older areas of the towns, this has ceased to be the case, but such schools are only a small proportion of the total in a New Town.

There is a considerable emphasis upon the educational benefits of New Towns, within their own publicity. The Reith Report noted that where private schools did not exist, those from higher income groups tended to send their children to state schools, and stated "Scottish and some English experience shows that where this happens more informed and active public interest is taken in the schools, and their standard is therefore higher."⁸⁴ Schaffer has reported one headteacher as saying: "The change in the children is unbelievable. I put it down entirely to the change in environment."⁸⁵ In his book 'The New Town Story' he went on to state, "The education standards in New Towns are high, the percentage who stay on after the minimum leaving age is well above the national average, and many of the children who do leave then take advanced courses in the new technical colleges."⁸⁶

This statement is based upon aggregate data from the New Towns in the South East of England.⁸⁷ It is not the result of rigorous analysis, and does not take into account such important educational indicators as social class and family size.

Although the evidence that does exist would seem to favour New Towns, a more thorough investigation is necessary before it can be said that the New Towns have achieved their Social Policy objectives, with regard to improving general educational performance. The benefits of New Towns to the second generation of children remain essentially unproven. Colin Ward, Education Officer of the Town and Country Planning Association, has summarised the situation in somewhat colloquial language: " I have looked in vain for any solid comparative work on children's educational attainment in New Towns, as compared with other urban environments.

All I have seen is hurrah-statements that the kids are healthier, happier and do better at school than they did in Slumsville, which may be true but is hardly evidence,"⁸⁸

NOTES

1. Sir. Frederick Osborn in his book 'New Towns after the War' felt that the larges bouquets for the New Town concept should have gone to Moses, Ezekial, Plato, Aristotle, More and Owen.
2. The Report of the Committee on unhealthy area, chaired by Neville Chamberlain.
3. "Report of Departmental Committee on Garden Cities" HMSO 1935.
4. Report of the Royal Commission on Distribution of Industrial Population (Barlow), Cmd 6153 HMSO 1940.
5. Report of the Committee on Compensation and Betterment (Uthwatt), Cmd 6386.
6. Report of the Committee on Land Utilisation in Rural Areas (Scott), Cmd 6378.
7. Abercrombie, Patrick, "Greater London Plan 1944" HMSO 1945.
8. Lord Reith was the Chairman of the Committee, it produced three reports, two interim and one final reports. Cmd 6759, Cmd 6794, & Cmd 6876 respectively.
9. E. Howard "Garden Cities of Tomorrow". Faber and Faber 1965, p.50. This book was originally published as in 1898 as "Tomorrow; a Peaceful Path to Real Reform."
10. McAllister, G & E, "Town and Country Planning" Faber and Faber 1941.
11. McAllister op. cit p.1.
12. McAllister op. cit.p.8.
13. McAllister op. cit.p.8.
14. Titmus, R.M. e.g. "War and Social Policy" in "Essays on the Welfare State", Allen and Unwin 1958.
15. Marwick, A. e.gs. "Britain in the Century of Total War" Pelican 1970. and "The Impact of the First World War on Britain", Journal of Contemporary History, January 1968.
16. Andrzejewski, S. "Military Organisation and Society" 1954.
17. "Report of the Committee on Social Insurance and Allied Services," Cmd. 6404.

18. "Interim Report of the New Towns Committee". Op. cit. p.2.
19. Osborn.F.J. and Whittick.A. "The New Towns", Leonard Hill 1963, p. 103.
20. Before the 1945 election, Lewis Silkin had been Chairman on the L.C.C. planning committee. Members of the Town and Country Planning Association were members of all the major political parties, but the Labour Party Committee on Reconstruction included many more members of the T.C.P.A. than that of any other party. Gilbert McAllister, the joint author of "Town and Country Planning" became a Labour M.P. and Authur Greenwood, deputy leader of the Labour Party, and a member of the war cabinet wrote the foreward to McAllister's book.
21. Reith Report, op.cit. p.10. para.22.
22. Reith Report, op.cit. p.10. para.25.
23. Reith Report, op. cit.p.11. para.25.
24. Reith Report, op. cit.p.10. para.25.
25. Reith Report, op. cit.p.10. para.25. see also Peter Willmott in "Evolution of a Community" p. 112 to 117.
26. Hume.V. "Neighbourhoods in Scottish New Towns" Ph.D.Thesis Edinburgh U. 1969.
27. Heraud. B.J. "Social Class and the New Towns" Urban Studies. February 1968.
28. Reith Report op.cit. p.10. para.25.
29. V.Hume. op.cit.
30. For example Redditch and Livingston no longer use a unit so small as one based on a two stream primary school. Redditch bases its development upon the maximum provision of public transport and is developing 'beads' capable of supplying two and three primary schools with children.
31. Heraud.B.J. "The New Towns and London's housing problem" Urban Studies. February 1968.
32. Lloyd Rodwin "The British New Towns Policy" Cambridge Mass 1956. p. 83.

33. Reith Report. p.10 paras. 23 and 24.
34. Heraud. B.J. op.cit (1968) Willmott in Dagenham noted the exodus of white collar workers from the Beacontree estate, producing a 'one-class' area. Willmott.P. "Evolution of a Community" p. 109 onwards.
35. Wirz.H. "A Comparison of Social Organisations in three Scottish New Towns". Ph.D. Thesis. Edinburgh 1972. p.352 - 398.
36. Burns. 1968. "Urban Styles of Life" Hume.V. op.cit.
37. Hart.Mrs.J. Personal Communication, she was employed by East Kilbride Development Corporation 1955-57..
38. Cumbernauld has long had a S.N.P. controlled burgh council and now the S.N.P. control the district council.
39. Willmott.P. "East Kilbride and Stevenage." Town Planning Review No. 34.
40. The ten were; Stevenage, Crawley, Hemel Hempstead, Harlow, Hatfield, Welwyn, Basildon, Bracknell(for London), East Kilbridge and Cumbernauld. The five were: Newton Aycliffe, Peterlee, Corby, Cwmbran , and Glenrothes.
41. Telford, Milton Keynes and Central Lancashire New Town all planned for population increases in the region of 200,000.
42. These are Skelmersdale (for Liverpool), Washington(for Tynside), Telford and Redditch (for the West Midlands conurbation).
43. Donnison.D. "The Government of Housing" Pelrean 1967. p.54.
44. Blair.T.L. "The International Urban Crisis" Paladin 1974.p.148-149.
45. Schaffer.F. op.cit. p. 101.
46. Schaffer.F. op.cit. p.101.
47. In Redditch New Town, at January 1976, less than 10% of 2,000 houses built by private builders reached Parker Morris standards.
48. Guardian 4th July 1967. in Schaffer. op.cit.p.101.
49. G.E.Kidder Smith. "The New Architecture of Europe" pp.36-9 in Donnison. op.cit. pp.54-55.
50. Osborn.F.S. & Whittick.A. "The New Towns" Leonard Hill,London 1969. p. 46.

51. Headley.B.W. "Indicators of Housing Satisfaction; A Castlemilk Pilot Study" Occasional Paper No.10. Survey Research Centre, U. of Strathclyde.
52. Osborn & Whittick. op.cit. p.45.
53. Schaffer. op.cit. p.113.
54. The Scottish figures are based on an overcrowding yardstick of $1\frac{1}{2}$ persons per room, whilst most of the Development Corporations use a yardstick based on bedspaces.
55. A standard of six acres open space per 1,000 population is called for by the National Playing Fields Association and the Ministry's Technical Memorandum No.6.
56. Reith Report. op.cit. p.43. para.189.
57. Sillitoe.R.R. "Planning for Leisure". HMSO. 1969.
58. Sillitoe. op.cit.
59. Sillitoe. op.cit.
60. Sillitoe. op.cit.
61. Sillitoe. op.cit.
62. Wirz.H. op. cit.
63. Wirz. H. op. cit.
64. McAllister. op.cit. p.3.
65. Wiseman.S. "Education and Enviroment". M.U.P.1964. pp.81-85.
66. Report of Ministry of Housing and Local Government, 1960, Cmd.1435 p.96.
67. Willmott and Young note this in their examination of "Greenleigh" on outer London development, rehousing people from the inner city - see "Family and Kinship in East London." pp.131-169.
68. Blair.T.L. op.cit. p.120.
69. E.g. the work of Park, Burgess and Shaw. (see bibliography).
- 70.
71. Lord Taylor and Sidney Chave. "Mental Health and Enviroment", Longmans 1964.
72. Op.cit. p.175.
73. Op.cit. p.163

74. Op.cit. p.168.
75. Op.cit. p.168.
76. Op.cit. p.174.
77. Washington Development Corporation: Vandalism: A Study of Washington New Town 1972.
78. Cumbernauld Development Corporation.
79. Between 1951 and 1961, the London New Town created many more jobs than residences. Ogilvie.A.A. New Soc. 23.9.71. Guardian 23.10.75. noted a much higher level of employment in the N.E. New Towns than in the rest of the region.
80. Reith Report p.9. para.22. A town is "self contained" if it provides enough jobs of wide enough distribution to provide employment for the towns employable population.
81. A.A.Ogilvie, Town Planning Review, Vol.42. No.2.
82. Whereas 8.1% of the population are classified as unskilled workers (Census,1966), about 53% of unemployed men in mid-1970 were so classified (John Hughes, 'The Low Paid' p.170 in 'Labour and Inequality,' P.Townsend and N.Bosanquet, Eds. 1972).
83. Reith Report op.cit. pp.36 and 37, paras, 151 to 158.
84. Reith Report op.cit. p.38. para. 162.
85. Schaffer.F. op.cit. p.190.
86. Schaffer.F. op.cit. p. 131.
87. Schaffer.F. personal communication.
88. Colin Ward. personal communication. March 1972.

CHAPTER TWO

Indicators of Educational Attainment

At the end of the Second World War, the government's policy for the development of education in Great Britain was applied to Scotland by the Education (Scotland) Act of 1945. The Act contained fewer important innovations than the English Education Act of 1944, since some of the major changes effected by the English measure had already been carried out in Scotland, e.g. the recognition of all forms of post primary education as secondary education. Also the abolition of fee paying in all state schools was not extended to Scotland. The Act was passed by the wartime coalition government and although less radical than much of the post-war legislation, it was considered as an instrument of reconstruction by the post-war government. The two Acts were heralded as providing free secondary education for all.¹ The post-war period also opened with a new circular on teaching methods,² which indicated another change in the pre-war status quo.

The Reith Report noted "the new conceptions of education embodied in that Act; their emphasis on active instead of on passive occupation for the pupils necessitates more playing fields, gardening space, rooms for practical work, open-air physical training, and extensive open single storey planning to admit the maximum of sunshine and fresh air."³

Since that time, education has been a continuing centre of academic and political discussion, partly as a result of the drive for comprehensive reorganisation, a question not resolved by the 1944 and 1945 Acts and also because of the continued stratification of the educational attainments of those from different social backgrounds. Several government reports have been produced, which contained considerable investigations of education and educational attainment.

In the fifteen years from 1959, no less than five major government reports on education were published.⁴

The stratification of educational attainment was a major focus in all these investigations and in many others. Different and conflicting explanations of this stratification were put forward throughout this period, and these played no small part in the controversies over 'progressive' teaching methods and over comprehensive education, which were highlighted by the Black⁵ and the Red Papers⁶ on education.

The explanations offered can be divided into three different viewpoints, the first, that of the Black Papers, is essentially conservative and leads to conclusions which are in opposition to 'progressive' methods of teaching and comprehensive reorganisation, the second is that of the Red Paper and is radical in its appraisal of the needs of the present educational system; in part it rejects much of what is referred to as 'educational achievement', in that it is a value loaded product of a highly stratified society. The third viewpoint is that of those who accept that educational attainment is the result of a definite state of affairs either in the school, in the community or in the home, which can be investigated and determined and, where necessary, remedied, whilst retaining the fundamental structure of the present educational system and present society. This latter viewpoint has adherents who are close to the other camps in certain respects and as such contains a much broader set of views than the other two.

The debate around these points of view has frequently involved two concepts, those of intelligence and social class. The interpretation and importance of these two concepts differs greatly amongst the three positions. A great deal of these differences often revolve

around different interpretations of the same data. One viewpoint insists upon a particular causal sequence, whilst the others reject it.

These differing interpretations are the result of the limitations of any statistical approach to the problem. The tendency of the inhabitants of Moscow to go to bed shortly after those of Auckland get up is repeated every day, yet few would argue that the relationship between the two phenomena is a causal one. It is an association from which a causal relationship, involving the period of rotation of the earth, could conceivably be drawn, depending upon a priori assumptions. Correlation analysis, no matter how sophisticated depends upon such a priori assumptions, if other than mere association is to be concluded. Other yet more sophisticated methods of analysis suffer the same limitation. Lancelot Hogben has concluded on factor analysis: "Of itself, it can at best lead to a more satisfactory taxonomy, but then only if we are clear about what and why we want to classify. It cannot disclose a causal nexus; and we must judge its usefulness as a means for unmasking unsuspected regularities of nature, of personality or of society by its fruits alone." ⁷

Whilst the various techniques can disclose a lack of association, the particular difficulty with the debate between these points of view, is that the parties tend to agree on many of the associations between educational attainment and social conditions, but radically and vehemently disagree on the types and directions of relationships between the various pieces of evidence. The disagreements are clearly illustrated by considering social class and intelligence and their relationship to educational attainment.

Intelligence and Social Class

'Intelligence' is an abstraction from behaviour, it is a construct or concept used primarily by psychologists to describe certain aspects of behaviour. As such its definition can differ from one social scientist to another. However, apart from those who reject the concept altogether, a certain concensus around that which constitutes the core of the construct can be determined.

In the last decades of the nineteenth century, Herbert Spencer and Francis Galton propagated the view that there was an important general ability super-ordinate to and distinct from various special abilities, such as those in mathematics, foreign languages or administration. This view was supported by leading neurologists of that era, and received statistical support from Karl Pearson.⁸

In the first decade of the twentieth century Binet produced a standardised method measuring intelligence, in response to the needs of the French education system, and within a few years Burt was using such tests for the London County Council.

"In the succeeding thirty or forty years the work of these pioneers was extended and refined, but few fundamental developments occurred. Since the Second World War, the importance of general mental ability has been more widely questioned."⁹ It is in this questioning that the various viewpoints conflict.

"Discussions of the intelligence of different social classes or different ethnic groups have been, and still are, characterised by bitter controversy and misunderstandings, though we are beginning to realise at last that much of the trouble is due to people using the term intelligence in different senses."¹⁰ Professor Vernon has defined these different senses, as intelligence A, B and C, where

intelligence A (Innate Intelligence) is "innate capacity, something which the child inherits from his ancestors through the genes, and which determines the mental growth of which he is capable. It is educability as distinct from acquired knowledge or skills." ¹¹

Intelligence B (Intelligent Activity) refers to "the child or adult who is clever, quick in the uptake, good at comprehending and reading, mentally efficient." ¹² Intelligence C (Measured Intelligence) is the "Mental Age or I.Q. or score on one of the widely used intelligence tests." ¹³

In considering these three definitions and the relationships between them, the fundamental disagreements between the three viewpoints can be clearly illustrated. Two main points of cleavage can be discerned, the first concerns the validity of intelligence tests and hence the concepts of measured intelligence and intelligent activity and the relationship between them. The second is concerned with the relationships of heredity and environment to intelligence, and hence the concepts of innate intelligence and intelligent activity and the relationship between them.

Measured Intelligence, and its relationship to Intelligent Activity

The conservative view of this relationship is that general ability and achievement relate closely to intelligent activity, which in turn relates closely to measured intelligence, i.e. intelligence is the prime factor in attainment and this intelligence can be measured. The radical view points out the deficiencies of intelligence tests, especially that they can not be 'value-free', ¹⁴ i.e. that the tests reflect the orientation and values of those setting the test, which is itself a crude measure of such a subtle concept as intelligence; the result being an undervaluation of the intelligence of minority.

groups. Those in this position hold that measured intelligence is not sufficiently closely related to intelligent activity, and that no great reliability can be placed in test results. The third or 'moderate' view would be that tests are useful tools in the evaluation of educability, but that they are subject to considerable deficiencies, which must restrict the contexts in which they are useful.

Those holding the radical viewpoint challenge not only the measures of achievement used in the education system, but also the orientation of the system itself by holding that what the tests or examinations are measuring should not be a priority in education.¹⁵

In deciding to measure attainment with regard to the standard measures of educational attainment at present, e.g.s. 'O' levels and highs, which are related to success in acknowledged terms, i.e. the measures used by the education system itself, the argument is bypassed, although not answered, and the debate shifted onto a different basis, that of the accuracy of measured intelligence with regard to standard examination criteria.

Educational attainment as measured by examination successes is related to I.Q., although the relationship is by no means one to one.¹⁶ Educational attainment, as measured by standard attainment tests falls into a consistent relationship with both examination successes and I.Q..¹⁷ Its relationship to the latter being closer than that of the examination results. Intercorrelations of 0.8 and 0.9 are common between the two.¹⁸ Wiseman stressed that intelligence tests gave results less dependent upon the children's environmental background than measures of attainment.¹⁹ He cited the work of Fraser in Aberdeen, who found a multiple correlation coefficient for I.Q. with all home background variables of 0.687, compared to

a coefficient of 0.752 between these variables and attainment.²⁰ Douglas has noted a similar discrepancy,²¹ and several twin studies also cited by Wiseman revealed the same differences.

Both Wiseman and Vernon have rejected both the possibilities of 'culture-free' and 'culture-fair' tests,²² and Vernon in his book 'Intelligence and Cultural Environment', has stressed a large degree of indeterminacy in assessing the bias of intelligence tests when given to different social and ethnic groups, noting that depending which type of intelligence tests are administered considerably different results can be obtained from the same population. Bloom has noted test intercorrelations below 0.5,²³ although this is unusual.

The relationship of measured intelligence to other manifestations of ability shows considerable variation depending upon the tests used, and the cultural milieu of those tested. It is consistently both positive and significant throughout a wide variety of intelligence tests and the variations due to differences in social and environmental background are less than those found in attainment tests. However in so trying to minimise the effects of social conditions, the predictive ability of the tests with regard to future successful children suffers.

The 'Nature - Nurture' Debate

The relationship between Innate Intelligence and Intelligent Activity is that which is determined by the relative effects of heredity and environment upon intelligence. As such it is part of the longstanding debate on the 'Nature - Nurture' issue. The viewpoints on this are such that the validity of a concept such as that of 'Innate Intelligence' is rejected by many protagonists,

and not only those with the most radical perspective.

A great deal of heat has been generated in the debate on the relative importance of nature and nurture in the determination of intelligence. In the words of Liam Hudson: "We are in the territory of the atavistic".²⁴ However, strangely, there is a remarkable concensus upon certain things. No authorities of repute now dismiss the enviroment as having no effect upon intelligence.²⁵ The degree of this effect is what is disagreed upon. The conservative view holds that relatively little of intelligence is accounted for by enviromental influences, i.e. no more than twenty to twenty five per cent of the variance in intelligence. The other two camps almost join forces in an attack upon this position, those of the 'moderate' position being more likely to do battle on a statistical basis because of their acceptance of the validity of I.Q. tests.

Much of the controversy has centered upon studies of identical twins. Wiseman, in defending intelligence tests, cited several studies of twins.²⁶

Correlation Coefficients between the I.Q.s of pairs of twins

Table 2.1.	(No.)	<u>I.Q. Correlation</u>	<u>Attainment Correlation</u>
		<u>Coefficient</u>	<u>Coefficient</u>
Identical twins reared together	(133)	.92	.93
Identical twins reared apart	(40)	.78	.59
Non identical twins reared together	(222)	.58	.86

In using these figures he stressed that I.Q. is heavily dependant upon heredity (in the case of identical twins reared apart, some 60% of the variance in the scores of the children is accounted for by the

correlation, compared to only 35% for non identical twins reared together), and that attainment is much more dependent upon environment, and so reflects environmental disadvantage more readily (the figures for attainment are the reverse of those for intelligence, some 70% of the variance in the scores of non-identical twins reared together is accounted for by the correlation, compared with 35% for identical twins reared apart.)

The arguments about twin studies have frequently dealt with methodological considerations. Twins are unusual because of their identical inter-uterine environment, because of their frequently lower than average I.Qs. and because they tend to spend a considerable part of their first few months together, even when they are later separated.²⁷ Adopting parents also tend to come from similar social strata, and hence offer the children they adopt somewhat similar environments.

Anastasi²⁸ divided a group of identical twins separated during their first three years into two groups. The first group consisted of eleven pairs raised in educationally similar environments, in this group there was a rank order correlation between pairs with I.Q. of 0.91. The second group consisted of eight pairs in less similar educational environments, and the correlation between pairs with I.Q. was 0.24. Bloom after reviewing this, and other work in the field, concluded that the long term effect of extreme environments may effect I.Q. to the extent of 1.25 standard derivations, i.e. about 20 points; this he regarded as a fair estimate, whilst being "not firmly convinced of the magnitude of the differences produced by abundant and deprived environments"²⁹

A major problem with all work with separated twins, is that

sample sizes are always small. The number of identical twins raised in different environments from birth is miniscule. They are also something of a special case, in that the genetic similarities of social and ethnic groups are of a different order from those of twins, even non-identical ones.

Jencks,³⁰ in a review of all major American research in this field, concluded that heredity accounts for about half the variance in intelligence scores amongst fraternal twins. Upon dealing with siblings, this figure drops to 25%, with 55% of the variance being explained by environment. The remaining 20% is made up of what Jencks termed a 'double bonus'. This term he used to refer to that benefit gained by children with an advantageous genetic make up who also come from an advantageous home.³¹

Also of advantage to the genetically well endowed child, is that they will tend to elicit attention and stimulation, which another child might not get. Jencks included a review of non-American, especially British, work in his book. He concluded; "These studies suggest that there are important differences between countries. The American studies yield consistently lower heritabilities than the English studies. The most plausible explanation for this is that the children's environments are more similar in England, than in the United States. This would mean that environment explained more variation in the United States"³² than in England, and that genes explained relatively less.

Vernon noted that immigrant children in Great Britain are showing great improvements in intelligence and attainment,³³ now they are in a notably different culture from their traditional backgrounds, and stated that given widely different environments,

heredity could quite possibly account for less than 50% of the variance in attainment.

The evidence set out above indicates that environmental differences have a very significant contribution to the determination of intelligence. The contribution of environmental background to educational attainment, is considerably greater.

The Environmental Determinations of Intelligence

Whilst those with the most conservative views on intelligence have stressed innate differences and the accuracy of psychometric tests, they have not denied that the environment does have some effect on intelligence. Jensen, whose hypothesis that there are innate racial differences in intelligence has caused a furor especially amongst black groups in the U.S.A, does state that the poor material conditions in which blacks live has a marked effect upon their intelligence.³⁴ Eysenck has also been at pains to point out that material and social deprivation has a part to play in determining class differences in intelligence.³⁵

Representatives of all points of view note the correlation between measured intelligence and social class or socio-economic status. The most conservative viewpoint understands this to be largely the result of genetic differences, whilst the most radical explains it on the grounds of test bias, both in administration and content, in the poverty (both material and social) of the environment for those of lower status, and sometimes in the inadequacy of the very concept of intelligence.

The environmental determinations of intelligence investigated have usually been the same as those investigated with regard to educational attainment. This has been understandable as the concept

is primarily of educational use. However Wolf³⁶ has attempted to define the environmental determinants of intelligence, itself, using constructs drawn up for this purpose alone. He defined 13 such constructs:

1. The nature of intellectual aspirations of the child.
2. The nature of intellectual aspirations for the child.
3. Amount of information about the child's intellectual development.
4. Emphasis on the use of language in a variety of situations.
5. The nature of rewards for intellectual development.
6. Opportunities provided for enlarging vocabulary.
7. Emphasis on correctness of usage.
8. Quality of language models available.
9. Opportunities provided for learning in the home.
10. Opportunities provided for learning outside the home.
11. Availability of learning supplies.
12. Availability of books, periodicals and library facilities.
13. Nature and amount of assistance provided to facilitate learning in a variety of situations.

There was a multiple correlation between these ratings and I.Q. of 0.76. This compares with a coefficient of under 0.40 found for social status, occupation and education with I.Q. Wolf divided the list into two groups, the first of those variables which were believed to be indicative of the parents response to the child and the second, of more stable characteristics of the parents, both correlated at 0.70 with the children's I.Qs.

The constructs used by Wolf are not radically different from those used by researchers into educational attainment, and may be considered along with them in any interpretation of children's responses to a new learning environment. The two constructs of intelligence and attainment correlate at a high level and the line of demarcation between them is drawn in different ways by different

researchers, such that there is a very large area of overlap.

An examination of over thirty of the post - 1945 investigations ³⁷ of the determinants of educational attainment revealed over 120 specific indicators of academic performance. However, many of these indicators virtually duplicate others.

They can be reduced to eight major characteristics which can be grouped into three main areas, those of the home, the neighbourhood and the school, and their relative importance assessed.

The Home

(i) Home Amenities

The standard of the amenities of the homes of children have been noted to be reliable indicators of educational attainment by several investigators. Fraser found a correlation coefficient of .45 between living space and attainment. ³⁸ Douglas used a classification determined by overcrowding, bedsharing, running hot and cold water and sole-use of kitchen and bathroom, and found significant differences in the attainments of children in relation to their homes being adequate in these amenities. ³⁹ Wedge and Petzing ⁴⁰ have attempted to quantify the effects of poor housing conditions upon educational attainment. Drawing their sample of eleven year olds from the 1958 cohort of the National Child Development Study, they assessed the effects of overcrowding, (at a rate of more than 1.5 persons per room) and of a lack of amenities (i.e. indoor toilet, bathroom and hot water supply) upon arithmetic and reading.

Their figures were:

Table 2.2 Retardation in Arithmetic and Reading Achievement of 11 year olds due to inadequate housing conditions

	<u>Reading</u>	<u>Arithmetic</u>
Overcrowding	9 months	2 months
Lack of Amenities	9 months	3 months

Such conditions tend to occur together, the one reinforcing the other, they are also associated with a second characteristic; low income.

(ii) Income

Flond, Halsey and Martin noted, in their work in Middlesbrough, that "the successful children at each social level were distinguished by the relative material prosperity of their homes."⁴¹ The Crowther Report noted a correlation of low incomes with early leaving. Mays⁴² also noted the association between poverty and educational deprivation in his study of a deprived area of Liverpool.

However, Wiseman maintained that educational deprivation is not mainly the effect of poverty, but that both are the products of other conditions. In his three surveys of Manchester between 1951 and 1964, he provided considerable evidence for this point of view. He maintained that a third characteristic is of considerably greater importance; parental aspiration for the child.⁴³

(iii) Parental Aspiration and Encouragement

The National Survey carried out for the Plowden Report also noted that parental aspiration was an important indicator of attainment. Amongst final year junior school pupils, aspiration was assessed as accounting for 20% of the variance in scores between schools, and as such was the most important determinant of attainment. It was however closely followed in importance by 'parental encouragement' which was measured by the time spent with the children, the degree of paternal responsibility and books brought home.⁴⁴ Kellmer Pringle noted that the initiation of discussions with teachers by parents was significantly related to reading achievement for three of the five social classes.⁴⁵ Elizabeth Fraser

also noted a similar relationship between parental encouragement and educational attainment.⁴⁶ Both the National Survey and Wiseman used the preferred school leaving age expressed by parents as yardstick with which to judge aspiration.⁴⁷

The desire of parents for their children to have 'good' or high status occupations is associated with success in examinations and higher attainment scores. Douglas, Ross and Simpson⁴⁸ have noted this and Swift⁴⁹ found that parents of working class children successful in the 11+, chose occupations significantly higher up the occupational ladder than parents of the unsuccessful.

However Goldthorpe, Lockwood, Bechhofer and Platt in their study of affluent workers in Luton noted that although manual workers had only slightly lower aspirations for their children than those of white collar workers, their children performed nowhere near as highly, and in fact slightly below the average for working class children, in the country as a whole.⁵⁰ Goldthorpe felt that other factors, such as a lack of knowledge about the schools and the education system, were of importance in negating any influence. this increased level of aspiration may have had upon achievement. This lack of knowledge is related to the parents lack of secondary education itself.

(iv) Parental Education and Literacy

The only other characteristic, which rated as highly as aspiration in its influence upon attainment in the Plowden Report, was the literacy of the home.⁵¹ Douglas took the importance of parental education to be axiomatic, and included it in his definition of social class.⁵² Wiseman also agreed with the importance of family literacy and found it of significance in all three of his analyses of the 1964 Manchester Survey. Elizabeth Fraser also noted

significant correlations between both parental education and reading habits, assessed by an evaluation of the quality of material read and frequency of reading, and the children's attainment.⁵³

(v) Family Structure

Certain characteristics of family structure are also related to the children's educational attainment. Douglas,⁵⁴ Kemp⁵⁵ and Fraser⁵⁶ all noted a negative relationship between family size and attainment. Nisbet,⁵⁷ whilst investigating verbal development, found large families to be a handicap in this process. Oldman, Bytheway and Horobin,⁵⁸ however, introduced a control for the use of birth control, and found that I.Q. rose with family size for those families using birth control, whilst there was a downward trend for the entire sample. He put forward the view that certain parental characteristics both determine family size and their children's ability, there being no causal link between the two.

The birth order of the child also relates to his or her attainment; only children tend to have higher scores than first born children, from whom performance deteriorates with increasing birth order. Both Douglas⁵⁹ and the 1947 Scottish Survey⁶⁰ noted this phenomenon. Halsey and Gardner,⁶¹ however, noted a class differential at work, within this overall trend; they found that the benefit derived by first born children of working class families was greater than that of middle class children. Horobin's work has not been replicated with respect to birth order, so no qualifications of this relationship can be stated, although they appear likely.⁶²

The loss or disablement of a natural parent is also related to poor performance by children. Fraser found such a relationship significant at the .01 level of probability.⁶³ Douglas, et al,⁶⁴ and Wiseman⁶⁵ also obtained similar results. Kellmer Pringle⁶⁶

found a distinct interrelationship with social class, such a home situation being highly significant for social classes I and II, yet having no association with attainment for social classes IV and V.

(vi) Social Class

Constantly recurring in the literature reviewed has been the concept of social class. In attempting to determine the importance of social class as a determinant of educational attainment, the central methodological problem of research into the determinants of attainment is brought to prominence.

Of the six subdivisions of home influence described above, all six are intercorrelated, usually significantly. The intercorrelations of all these six characteristics can be determined statistically, and their multiple correlation with attainment determined. However, to determine the relative impact of the characteristics, whether in a partial correlation analysis or in an analysis of variance, an 'a priori' order of presentation of the characteristics is needed, which to a large degree determines their order of importance. For example if variables A and B are both correlated with variable C, each with a coefficient of 0.8, and they are intercorrelated with a coefficient of 0.9, it would depend upon whether A or B was regarded as of primary importance, which finished up with a large correlation when the other was controlled for. It would be possible for A and C to correlate at 0.1 when controlling for B, thus negating any relationship at all. Also both A and B could independently be products of characteristic D, but the analysis would not show this up if D were not included.

Thus, in the analysis conducted on the National Survey, only three percent of the variance in scores between schools is ascribed to fathers' occupational group, whilst there was a very high correlation

coefficient between attainment and paternal occupation. Some 26% of the total variance was accounted for by parental aspiration, literacy and interest, thus making the contributions of paternal occupation and home amenities, both of 3%, appear relatively unimportant.⁶⁷

However, Henry Acland, in strongly criticising the main recommendations of the Plowden Report, which emphasised the stimulation of parental interest and involvement, concluded that parental involvement was of distinctly less importance than social class and income. This was done upon a reinterpretation of the data, after deciding that both parental aspirations and literacy were not measures of involvement.⁶⁸

The number of researchers who have found social class to be strongly related to attainment is long. Fraser,⁶⁹ Douglas,⁷⁰ Dale and Griffith,⁷¹ Kemp,⁷² Warburton⁷³ and Kellmer Pringle⁷⁴ all note this relationship.

Social class is also strongly related to home amenities, income, parental aspiration, encouragement, education and literacy. To a large degree it also determines the neighbourhood in which the family live and the schools their children go to.⁷⁵ The strength of the relationship between class position and educational success is such that both conservative and radical viewpoints agree upon it. Whilst those of the conservative persuasion explain it, and the interrelation of social class with the other phenomena mentioned above, on the grounds of the pervasive influence of genetic factors, those of the radical view follow Douglas Holly in his view that "Because an individual is born into a coherent and pervasive system of values attaching to a given social position it is probable that some young people will grow up naturally disinclined to think, act and feel in ways required for 'success' in the present educational system."⁷⁶

The School

The National Survey, the Manchester Survey of 1964⁷⁷ and Warburton's Survey of Salford all indicated a significant contribution by school conditions to the determination of educational attainment. All the three investigations indicated that about 20% of the variance in attainment could be accounted for by school conditions.⁷⁸

However, upon a breakdown of the overall influence of schools into specific characteristics, none of these is consistently of significance throughout the surveys. The 1964 Survey of Manchester noted seven school characteristics with notable correlations with attainment:

Table 2.3

The 1964 Manchester Survey

Average correlations of school variables with the 36 test variables

1.	Appearance and Sociability	.422
2.	Attendance	.414
3.	Streaming	.385
4.	Children qualified for Special School	.360
5.	Class size	.316
6.	School size	.315
7.	Homework	.303

Plowden Report. Vol. II p.357 table III

Of these seven characteristics, the first two refer to the community rather than the school, whilst the fourth(children qualified for a Special School) is more a measure of the level of attainment than an independent variable. Both streaming and homework are currently practised only in a decreasing minority of primary schools. The two remaining variables of class size and school size demonstrate the most peculiar relationship with attainment. The coefficients found by Wiseman are positive and therefore show a relationship which indicates that a very large class and school size will be related to a high level of educational attainment. This, in fact, masks what is a 'U' shaped distribution in

both cases, where medium sized schools and classes are related to high attainment, and both large and small are not. Warburton noted that large schools and small classes are related to higher attainment.⁷⁹

The National Survey of 1964 revealed only three school characteristics with a relatively consistent contribution to attainment; teacher's degree of responsibility, teacher's ability and the continuity of staff. All of these were, however, insignificant at certain age groups in the primary school. The teachers degree of responsibility accounted for 7% of the variance amongst final year pupils, but for none amongst first year pupils. Similarly teaching ability and continuity of staff discriminated between the sexes; they accounted for 8% and 4% respectively of the variance between schools for final year boys, yet for none amongst final year girls.⁸⁰

Both Douglas and Jackson and Marsden have noted that schools with a largely middle-class intake, tend to have a large proportion of high achievers including a disproportionate number from working class homes.⁸¹ Although such a social milieu will contribute to the school atmosphere, which was, for Warburton, an important variable,⁸² it is more the function of the community in which the school is set than of the school itself.

The overall effects of school conditions are consistently important in analyses of children's educational attainment, yet it is not possible to pin down which of those conditions are of most importance. Jackson found school policy the most important characteristic at the school, the National Survey demonstrated teaching competence to be the most important, and Warburton found progressive methods and teaching conditions of the greatest import.⁸³

Those characteristics which demonstrate most consistency are those linked to the composition of the catchment area.⁸⁴ Once these are



excluded, the position of the remaining characteristics is vague.

Their salience in particular schools may depend to a large degree upon the personalities and relationships of the members of staff. However a definite conclusion is not possible upon the basis of the present evidence.

The Neighbourhood

Most of the information available upon the effects of the neighbourhood upon educational attainment is the result of Wiseman's work in Manchester. Between 1951 and 1964, four surveys in this area were carried out under his supervision; the Manchester Surveys of Secondary Schools in 1951 and 1957, the Salford Survey, conducted by Warburton, in 1957, and the Manchester Survey of 1964, which appeared in the Plowden Report.

All four of these Surveys revealed that the socio-economic characteristics of each neighbourhood were of notable importance. Also of significance were two other characteristics, revealed after factor analysis of the data, 'social disorganisation' and 'parental care'. The factor of social disorganisation was described by such variables as: the incidences of mental deficiency, illegitimate children and the birth rate. 'Parental care' was described by its deficiency, such that there were high incidences of neglected children, infant mortality and verminous children. 85

Mays, in an investigation of an educationally deprived area in Liverpool, concluded that sub-cultural factors, such as inertia and hedonism, were important in explaining educational deprivation, yet he found delinquency to be not a great problem. 86

Sugarman has also noted the importance of local social pressures operating through peer groups amongst secondary school pupils. He found underachievement to be associated with a high commitment to an out-of-school 'teenage' role and an unfavourable attitude to the school,

both of which were strongly associated with homes of low intellectual quality.⁸⁷

Over large areas, Byrne and Williamson⁸⁸ have discerned other criteria which effect the general level of educational attainment. They postulate that the different political priorities and policies of different local authorities ensure the distribution of resources in such a way as to effect the balance of attainment between different groups of children. They have concluded that Labour controlled local authorities, which tend to be more working class in composition, distribute a greater proportion of their educational resources to primary and lower secondary pupils, than Conservative controlled authorities, with the result that a higher proportion of further education and teacher training students relative to University entrants, are found in these authorities i.e. the distribution is more egalitarian. If this is the case, the social compositions of the authorities have produced differences through the agency of the political representatives they elect. Such work reinforces the importance of local structure in affecting attainment, but is on a much larger geographical scale than other work done on what are commonly called neighbourhood differences. However the relative wealth or poverty of local authorities does have some effect upon the standards of provision which they can implement. It is in traditionally depressed and deprived areas, usually in inner cities, that the lowest levels of attainment are found. The Educational Priority Areas set up as a result of the Plowden Report attempted to place the most needed resources in the most deprived areas. In order to do this, it was necessary to evaluate the need for educational priority status. A list of ten characteristics was used:⁸⁹

1. Occupational level
2. Free Meals

3. Housing overcrowding
4. Lack of inside toilet in the home
5. Poor attendance at school
6. Proportion of handicapped pupils
7. Proportion of immigrant children
8. Rate of turnover of teachers
9. Rate of turnover of pupils
10. Proportion of large families

Of these ten characteristics, nine relate to the structure of the population in the school's catchment area, about half of them refer to material or economic circumstances, e.g. overcrowding and free meals, and about half to social or cultural factors, e.g. attendance, and the rate of turnover of pupils. The social and economic factors are themselves related.

The importance of the neighbourhood in indicating educational attainment had been demonstrated before 1939 by Sir Cyril Burt, and the McAllisters used the relationship between urban deprivation and poor educational performance in their campaigns for the creation of New Towns.

The Importance of the Indicators in determining Educational Attainment

As has already been related, there are distinct methodological difficulties in assessing the relative importance of the various indicators, from any one survey. However from the research which has been described above, certain conclusions can be drawn.

The effects of the home and of the parents are of major importance. The largest correlations were consistently obtained between characteristics of the home and parents and educational attainment. Parental attitudes, aspirations and literacy are the greatest influence upon the child. To what degree they are conditioned by Social Class in in some doubt, (Plowden estimated about a quarter but others put it higher), but that they are, is not disputed. The National Survey demonstrated that 48% of

the total variance in attainment between schools was accounted for by parental attitudes, with 28%, and home circumstances, which evaluated material conditions, with 20%. This was a good deal more than half of the variance which was accounted for. When a within schools analysis was undertaken, the amount of variance accounted for by these two characteristics was 29%, with 20% going to parental attitudes and the remainder to home circumstances.⁹¹

In the within schools analysis, differences in schools and neighbourhoods were controlled for, and the resulting total of variance accounted for dropped, this indicating both the importance of these two factors, but also their interrelation with the distribution of attitudes and circumstances in the home.

According to the same survey about 17% of the variance between schools was accounted for by variations in school conditions, Wiseman, in his 1964 Survey, of that variance which was accounted for, 18% was the result of school differences, compared to sixty percent for the home and twenty for the neighbourhood.⁹²

Implications for Policy

The Plowden Report led to the formation of Educational Priority Areas, in which additional resources were given to schools in areas of high social deprivation in order to enable them not only to provide the best possible learning conditions for the children who attended them, but also to enable the schools to become foci for their communities. They were to do this because this would enable the teachers to involve the parents more and hence change their attitudes to education. This was done because the Plowden Research had led to the conclusion that parental attitudes were the decisive factor in determining attainment; and that "only about a quarter of the variation in parental attitudes is conditioned by the variation in circumstances.

The remainder must be conditioned to a large extent by communication and persuasion, so that it is reasonable to hope that an attempt to improve the co-operation of parents and teachers by persuasion might attain some success." 93

This action was attacked from both sides of educational and political spectrums. It was deemed as being a waste of money by those who believed strongly in the genetic determination of ability, and as attacking the problem from the wrong angle by those of a more radical persuasion. Bernstein attacked the report on three points; firstly that it proposed special 'compensatory education' for children in areas where educational facilities had long been below the national average; secondly that it directed attention away from school inadequacies to those of home, thus stigmatizing the community which the school is supposed to help; and thirdly that it neglected the entire educational process by just concentrating on the early years. He attacked schools, in general, for often being alien to the child in terms of its language and context; "If the contexts of learning are not triggers for the child's imaginings, are not triggers for the child's curiosity and explorations in his family and community then the child is not at home in the educational world". More particularly Bernstein has often stressed language and speech differences between middle class children and teachers and those of the lower working class. 94

Other critics were not as optimistic about the ability of the schools to remedy deprivation, even if differently oriented, as Bernstein. Little has stated that the education system is relatively impotent with respect to other social forces. 95 Titmus used the traditional criticism of the Left in his comments upon the recommendations: "We delude ourselves, if we think that we can equalise the social distribution of life chances by expanding educational opportunities

while millions of children live in slums without baths, decent lavatories, leisure facilities, room to explore and space to dream"⁹⁶

The performances of the E.P.A.S. have been reported in the volumes of the Halsey Report and other publications.⁹⁷ They have not been the only instruments of policy in the educational field, which have derived their structure from research. In the U.S.A. 'headstart' and 'homestart' derived much of their contents from the large I.Q. gains noted, among children given nursery education, by those of the Iowa School

No concensus has emerged. The conservatives maintain a position of largely genetic determination of ability, whilst the radicals hold that a more radical change within both the schools and in society is necessary for any significant success in the aim of a greater distribution of educational resources.

Conclusions

The evidence surveyed in this chapter has demonstrated that certain conditions in the physical and social environment of children have strong relationships with educational attainment. Most of the relationships demonstrated are based on the home and the influence of parental attitudes, aspirations and circumstances. However it has also been shown that the neighbourhood and the school are also the source of other significant influences on educational attainment. To a certain degree the attitudes aspirations and circumstances of the home are conditioned by the Society and the Community in which they are set. The relationship is a complex one and is certainly not one way. Particular communities have particular characteristics, which will be determined by the interaction of these forces. New Communities living in new houses with access to modern facilities should give their children the benefits of an adequate physical environment. If the New Towns have lived up to the aspirations of their protagonists they should also give them other benefits resulting from the social characteristics of their environment.

1. The two Acts legislated for the provision of free Secondary education for all children, but took up no position upon selection for different types of secondary education, in effect leaving the local authorities to decide upon what system of education to implement, within the limits of ministerial sanction.
2. Primary Education, 1946. Cmd 6973.
3. Reith Report. op.cit. p.36 para. 151.
4. These were:
 - 'Fifteen to Eighteen' H.M.S.O. 1959.
 - 'Half Our Future' H.M.S.O. 1963.
 - Report of the Committee on Higher Education, Cmd 2153. H.M.S.O. 1963.
 - 'Children and Their Primary Schools' H.M.S.O. 1967.
 - 'Educational Priority' H.M.S.O. 1972.
5. Cox, C.B., Dyson, D.E. (Eds), (a) "The Fight for Education: a Black Paper", Critical Quarterly Society, 1969. (b) "The Crisis in Education; Black Paper Two", Critical Quarterly Society, 1969.
6. Cuddihy, R. et al., Islanders Publications, 43 Pleasance, Edinburgh.
7. Lancelot Hogben, 'Statistical Theory', Allen and Unwin 1957, p. 275.
8. For a full treatment see H.S. Butcher 'Human Intelligence', Ch.1. Methuen 1968 and Burt, C. 'The evidence for the concept of intelligence,' Brit.J. educ. Psychol, 25, 158-177.
9. H.J. Butcher, op.cit. p.16.
10. P.E. Vernon, 'Intelligence and Cultural Environment' Methuen 1969, p.9.
11. P.E. Vernon. op.cit. p.9.
12. P.E. Vernon. op.cit. p.9.
13. P.E. Vernon. op.cit. 9.

14. The Chicago study of Bells et al. op.cit. is often quoted to substantiate this view. Seven widely different intelligence tests were given to children aged 9-14 from different social backgrounds. The proportion of items on the tests distinguishing between children of different backgrounds increased from 50% for 9 to 10 year olds to 65% for 13 to 14 year olds. The authors concluded that this was the result of the value laden nature of the tests themselves. See also Gordon. op.cit,
15. For a full exposition, see Douglas Holly 'Society Schools and Humanity' and 'Beyond Curriculum', both in Paladin.
16. See for example Liam Hudson. 'Academic Prediction' in 'The Ecology of Human Intelligence' Penguin 1970.
17. See Wiseman 'Education and Environment' M.U.P. 1964. and Floud and Halsey 'Intelligence tests, Social class and selection for Secondary schools' B.J. Sociology 1957.
18. Stephen Wiseman noted coefficients of .894 and .941 between reading and arithmetic attainment and intelligence respectively. op.cit p.187., see also p.71 for a review of material on the relationship between the two characteristics.
19. Wiseman.S. 'In defence of I.Q. tests'. New Society 21.5.64.
20. Fraser.E. op.cit.
21. Douglas, Ross and Simpson op.cit. p.32.
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conflicting explanations of the advantage of first born children,
the former based it upon a greater capacity for loneliness, whilst
the latter based it upon a lower capacity.
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64. Douglas et al. op.cit. pp. 102 - 108.
65. Wiseman, op.cit. 1967. p.374.

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67. Op.cit.1967. p.215.
68. Acland.H. 'What is a bad school' New Society 9.9.71.
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70. Douglas J.W.B. op.cit. p.76.
71. Dale and Griffith. op.cit.
72. Kemp.L.C.D. "Enviromental and Other Characteristics determining Attachment in Primary Schools"
73. Warburton "Attainment and the School Enviroment" in Wiseman.S. op.cit.(1964a). Upon completing a factor analysis of data collected from 42 schools in Salford, three principle factors emerged, of which the most important was that for socio-economic characteristics accounting for 24% of the variance in scores. pp.107-125.
74. Kellmer Pringle. op.cit. pp.517 to 518.
75. See for example DouglasJ.W.B. op.cit. Chapter 5. Wedge P. & Prosser H. 'Born to Fail' Arrow 1974, and Field.F. 'Unequal Britain' Arrow 1974.
76. Holly D. 'Society,Schools and Humanity' Paladin 1972.
77. Wiseman.S. 'The Manchester Survey' in Plowden Report. op.cit. Appendix 9.
78. The National Survey results indicated the school variables accounted for an average of 17% of the variance in scores both between schools and within schools. For the different groups of pupils, it ranged from 7% to 27% of the total variance. Plowden. op.cit. pp.208 table 3.
The Manchester Survey indicated that schools effects contributed 18% of 'enviromental' variance in test scores. Plowden.op.cit. p.365. para.56.
The Salford Survey determined that 18% of the variance in tests scores was accounted for by 'school atmosphere' and 7% by 'good teaching conditions'. Warburton op.cit. pp.115 to 117.

79. Warburton noted that both Kemp and Mollenkopf (op.cit) had noted the same relationships. Yet Davie 1971 (op.cit) observed upon controlling for size of school that large classes were related to high attainment.
80. Plowden Report. op.cit. Tables 4 and 5. pp. 209-221.
81. Jackson.B. and Marsden.D. 'Education and the Working Class' Routledge & Kegan Paul. 1962. p.93.
Douglas J.W.B. op.cit. chap.13.
82. See Note.78.
83. Jackson argued in his book on streaming that it resulted in a self-fulfilling prophecy, and that such selection resulted in the wider distribution of ability in Britain in comparison to other countries (e.g. Education attainment at 13 leaves England with a standard deviation over five times that of Poland, and Scotland over four times) op.cit. National Survey. op.cit. p.209.
Warburton. op.cit. p.107.
84. Wiseman. op.cit. (1967) found neighbourhood factors to be more important than those of the school. p.365.
Warburton found the socio-economic factor of the greater importance op.cit. p. 115.
Kemp's data similarly revealed socio-economic considerations to be the most important. In Warburton in Wiseman. op.cit. (1946a)p.117.
85. Wiseman op.cit. p.93 to 100. pp.133 - 146.
86. Mays.J.B, op.cit. p.189.
87. Sugerman. 'Involvement in Youth Culture, Academic Achievement and Conformity in School'. British Journal of Sociology 1967.
88. Byrne and Williamson 'Some intra-regional variations in Educational Provision and their bearing upon educational attainment - the case of the North East Sociology. Vol.6. No.1.
89. Halsey Report. op.cit. p.52.
90. Burt.C. 'The Backward Child' Univ.of London Press 1937. McAllister, op.cit. p.11.

91. Plowden Report Vol.II, Appendix 4, p.208, Table.3.

Percentages of Criterion (Attainment) Variation Accounted for by
Parental Attitudes, Home Circumstances and School Variables

	<u>All Pupils</u>	
	<u>Between Schools</u>	<u>Between Pupils with Schools</u>
Parental Attitudes	28	20
Home Circumstances	20	9
School Variables	17	17
Total Variance Accounted for	65	46

92. Wiseman.S. op.cit. (1967) p.365.

93. Plowden Report. op.cit. p.89. para. 26.

94. Bernstein.B. 'Education can not Compensate for Society'
New Society 26.2.70. for a full exposition of his views on
language see 'Class,Codes and Control' R.K.P. 1971.

95. Little.A. 'A Sociological Portrait: Education' New Society 23.12.71.

96. Cited in Bernstein B.op.cit.

97. Op.cit. and see also. Midwinter 1972 op.cit. and schools Council
Project in Compensatory Education. (op.cit)

98. Coleman, James S.et al.Equality of Educational Opportunity.
op.cit. and see for an example of early research. Neff. 'Socio-
economic Status and Intelligence.Psychological Bulletin 1938.

CHAPTER THREE

The Construction of Testable Hypotheses

In Chapter One, it was demonstrated that implicit amongst the aims of the New Towns Movement were two major social aims. The first of these sprang from the reaction to the urban squalor and deprivation of the last two centuries. This resulted in the aim of providing a better standard and quality of living for the residents of the New Towns than could be expected in the inner-city areas or the industrial villages of this country.¹ The second of these aims involved the redistribution of life chances concomitant upon the provision of similar standards of housing, health care and education for an entire community. The avoidance of social segregation and the desire for the integration of all sections of a 'balanced' community were laid out in the Reith Report.²

Later in the first chapter, areas of activity were enumerated, in which an evaluation of these objectives can be made. Seven such areas were examined of which education was one.³ That education is part of what may be called the quality of life cannot seriously be doubted. Education is also very concerned with the distribution of life chances.

Educational attainment is intimately connected with many of the aspects of life, as was demonstrated in Chapter Two. Amongst its strongest indicators and probably determinants are the attitudes, aspirations and literacy of the parents in the community, differences in lifestyles within the community and between it and others. Other strong influences on attainment are the material standards of the home and the social composition of the neighbourhood, the first of which is an indicator of material wellbeing, and the second one of social stratification.

An investigation of the level of educational attainment and its distribution amongst the population is highly relevant to an evaluation of New Towns with regard to their broad social aims, as well as with respect to the distribution and standard of educational attainment itself.

A perfectly functioning New Towns policy should impinge upon most of the characteristics which are good indicators of educational attainment. There should be no sub-standard housing in a New Town and overcrowding should be reduced to a minimum. Although it was hoped that New Towns would cater for a full cross-section of the population, their slight failure to provide enough jobs for unskilled workers has probably resulted in a very slightly more even distribution of income than in the country as a whole. The tradition of low unemployment in New Towns, although under attack in 1976,⁴ has also maintained a good level of income. A more balanced community and the facilities for a better standard of life such as open spaces, plentiful social organisations and libraries, should have had some impact upon the aspirations, attitudes and literacy of the community, although in almost all cases the education of the parents will have already been completed.⁵

Job and workplace relationships are no different in New Towns than elsewhere in Britain, so this focus of every workday will retain its impact upon stratification.⁶ However, a more balanced community with evenly distributed material standards may lessen the strength of its inter-relation with other characteristics.

The schools, being new, will offer better facilities to their pupils than in the nation as a whole. The staff will tend to be young and more progressive, but they will also be less experienced.

The building of a neighbourhood unit round the school may help its relationship to the community in line with the recommendations of the Plowden Report.⁷

Neighbourhoods, in New Towns, have not achieved the goal of social balance, but they are set within a town which, to a very large degree, has achieved this aim. Also there are no great material differences in housing and amenity standards within or between neighbourhoods. The material aspects of neighbourhoods will be of a relatively high standard, and they will hopefully lack the characteristics of Wiseman's 'social disorganisation'.

In Chapter Two, eight areas were laid out, which have strong associations with educational attainment and do account for much of the variation in attainment in this country. They are:

- (i) Home Amenities
- (ii) Income.
- (iii) Parental Aspiration and encouragement
- (iv) Parental education and literacy
- (v) Family Structure
- (vi) Social Class
- (vii) School Conditions
- (viii) Neighbourhood Characteristics.

It has been noted that of these eight areas a New Town should have had an impact of six of them; only family structure and social class being unaffected. If it has succeeded in its aim of improving the quality of life, then the parental attitudes in (ii) and (iii) will be subject to change. These are the characteristics which the Plowden Research held to be most important in determining attainment. The benefit to those children from lower social classes should be greater, partly because of a more even distribution of material standards, but also because of a more balanced community.

If New Towns have gone a significant distance towards their social objectives, then a higher average level of attainment amongst New Town children may be expected than amongst children in the Country at large, and also a more even distribution of attainment should be observed.

However, other factors, than the successes of New Towns policy, may account for such phenomena. The schools, as was mentioned earlier, will be of a higher material standard, and the teachers younger and more progressive than the average. Such conditions may be held to be the most important in determining any advantage. The inconsistency of results about those school conditions which do effect educational attainment render this somewhat unlikely, but does not completely rule it out as an explanation.

Those who move to New Towns differ from a typical cross section of British Society in two ways. They are very much younger, and also slightly more skilled.⁹ That they have moved towns also differentiates them from most of their fellows. To do this they may have wider horizons, higher aspirations and generally somewhat different attitudes from an average cross section of Britons. Such differences may result from differences in acquired ability or even conceivably from genetic make-up. The implications of either of these possibilities for a measurement of their children's educational attainment is obvious.

Bearing in mind these considerations, it is possible to build three models to explain differences in parental attitudes and aspirations of a New Town population from those of a national sample:

- (i) The attitudes of the parents change after experience of life in the New Community.

- (ii) The attitudes held by the parents determine their decision to move to the New Town, and these attitudes are essentially unaffected by the move
- (iii) The attitudes held by the parents determine their decision to move to the New Town, but these are changed by the subsequent experience of life in the new community.

In order to evaluate the performance of New Towns in the educational field, it is necessary to set up some hypotheses, which take into account the salient points outlined above.

Because of general improvements in the material basis of life in New Towns, and also because of those factors which can give rise to attitude changes, a higher level of attainment than the national average is to be expected. However it is necessary to take account of those biases in social structure which may effect such an observation in formulating a hypothesis. The First Hypothesis is therefore. "The level of educational attainment of children in a New Town will be higher than that of a socio-economically comparable population."

The general improvement in material standards in New Towns is accompanied by a more even distribution of neighbourhood amenities throughout the Towns. These two effects together with possible changes in attitudes and aspirations will bring greatest benefit to those of the lower social classes and result in smaller class differences than those observed in a similar population. These benefits should help to bring about a more even distribution of life chances to the children of a New Town. The second hypothesis is therefore "Differences in the level of educational attainment between social classes will be smaller in the New Town than in a comparable population."

Movement between towns is an increasing phenomenon in industrial society, yet it is still not the norm for the British people. The characteristics of those who do move may well be different from the rest of the population. This can be said to doubly apply to those moving to a New Town. It is to be expected that they will have certain different reasons for moving home. These different reasons may well indicate other differences, not only from the rest of the population but from one another. However there is no evidence to predict whatever divergencies may exist, so an investigation of these reasons necessitates an open hypothesis. Therefore the Third Hypothesis is "The different reasons given for moving to a New Town will indicate differences of attitudes and behaviour and hence attainment amongst the children of those moving."

As it takes time to create a New Town, individuals resident will be subject to the social influences generated by the development for different lengths of time, and so should respond differentially; the longer the residence, the greater the response.¹⁰ The Fourth Hypothesis is therefore, "Within similar social and economic circumstances, educational attainment will correlate with the length of stay in the New Town."

Similarly a decrease in class differences in attainment will be expected the longer various groups have been resident in the town. The Fifth Hypothesis is therefore "The longer the residents have been in the town, the smaller the differences in educational attainment between the social classes will be."

As the older New Towns were built upon the neighbourhood principle, it would be reasonable to expect a correlation between

the age of the neighbourhood or precinct and the educational attainment of its children. However New Towns have not been immune from the process of social differentiation, and in the formulation of a hypothesis both these factors must be taken into account. The Sixth Hypothesis is therefore: "Educational Attainment will be positively linked to both the age and social structure of the precinct."

In investigating the above six hypotheses it will be possible to evaluate the success of New Towns in the field of education, and to determine some of the determinants of this success or failure. It will also provide an insight into the progress New Towns have made in their broader social objectives.

Addendum to Chapter Three

In this chapter, in order to explain possible differences in the parental attitudes of a New Town population from those of a national sample, three models were set up to account for the postulated different attitudes of the New Town residents. The three models were:

- (i) The attitudes of the parents change after experience of life in the new community.
- (ii) The attitudes held by the parents determine their decision to move to the New Town, and these attitudes are essentially unaffected by the move.
- (iii) The attitudes held by the parents determine their decision to move to the New Town, but these are changed by the subsequent experience of life in the new community.

Of the six hypotheses set out in the chapter, some are incompatible with certain of the three models.

The First Hypothesis : "The level of educational attainment of children in a New Town will be higher than that of a socio-economically comparable population."

The Second Hypothesis : "Differences in the level of educational attainment will be smaller in the New Town than in the comparable population."

Both these hypotheses deal only with the differences between the two areas and not with the aetiology of any such differences. As such they are compatible with all three models.

The Third Hypothesis : "The different reasons given for moving to a New Town will indicate differences of attitudes and behaviour and hence educational attainment amongst the children of those moving."

This hypothesis postulates differences between the incoming population and a comparison population before any move is made and hence is compatible with either the second or third models but not the first.

The Fourth Hypothesis : Within similar social and economic circumstances educational attainment will correlate with the length of stay in the New Town."

The Fifth Hypothesis : "The longer the residents have been in the town the smaller the differences in educational attainment between the Social Classes will be."

The Sixth Hypothesis : "Educational Attainment will be positively linked to both the age and the social structure of the precinct."

These three hypotheses all deal with the effects of the town upon its inhabitants, and as such are compatible with the first and third models but not the second.

1. See pages 2 to 4 of Chapter One. Ebenezer Howard in the introduction to 'Garden Cities of Tomorrow' laid out the disadvantages of both town and country in his day and concluded that only a new town in the country could remedy the deficiencies of both. op.cit. p46.
2. Op.cit. p.10. para.26, also see pages 4 to 8 of Chapter One
3. Ch.1. pp. 14 - 25.
4. Skelmersdale's unemployment rate was twice the national average in February 1976, and Telford's female unemployment rate was three times the West Midlands Regional Average. These were however exceptions to a generally rosier employment picture in New Towns.
5. It can be argued that as New Towns are designed to prevent the demoralisation of the community, some impact upon those family characteristics which result from demoralisation, e.g. their break-up, should result. No-where has this been specifically proposed since the days of Owen; see Engels, 'Socialism, Utopian and Scientific' for a radical evaluation of the New Lanark project. pp.114 - 115 (op.cit)
6. The central fact of occupation determined many of the differences between the materially equal 'affluent workers' of Luton and white collar workers, see Goldthorpe et al.(op.cit especially conclusions p.157 onwards)
7. See Chapter Two p.42. The Report recommended a greater interpenetration of school and community to foster relations between parents and teachers and hence effect parental attitudes and behaviour.
8. Ch. II
9. Ch.I. p.11. The difference is small with the New Towns having 5% more non-manual or supervisory workers and 2% more skilled workers than the national average.

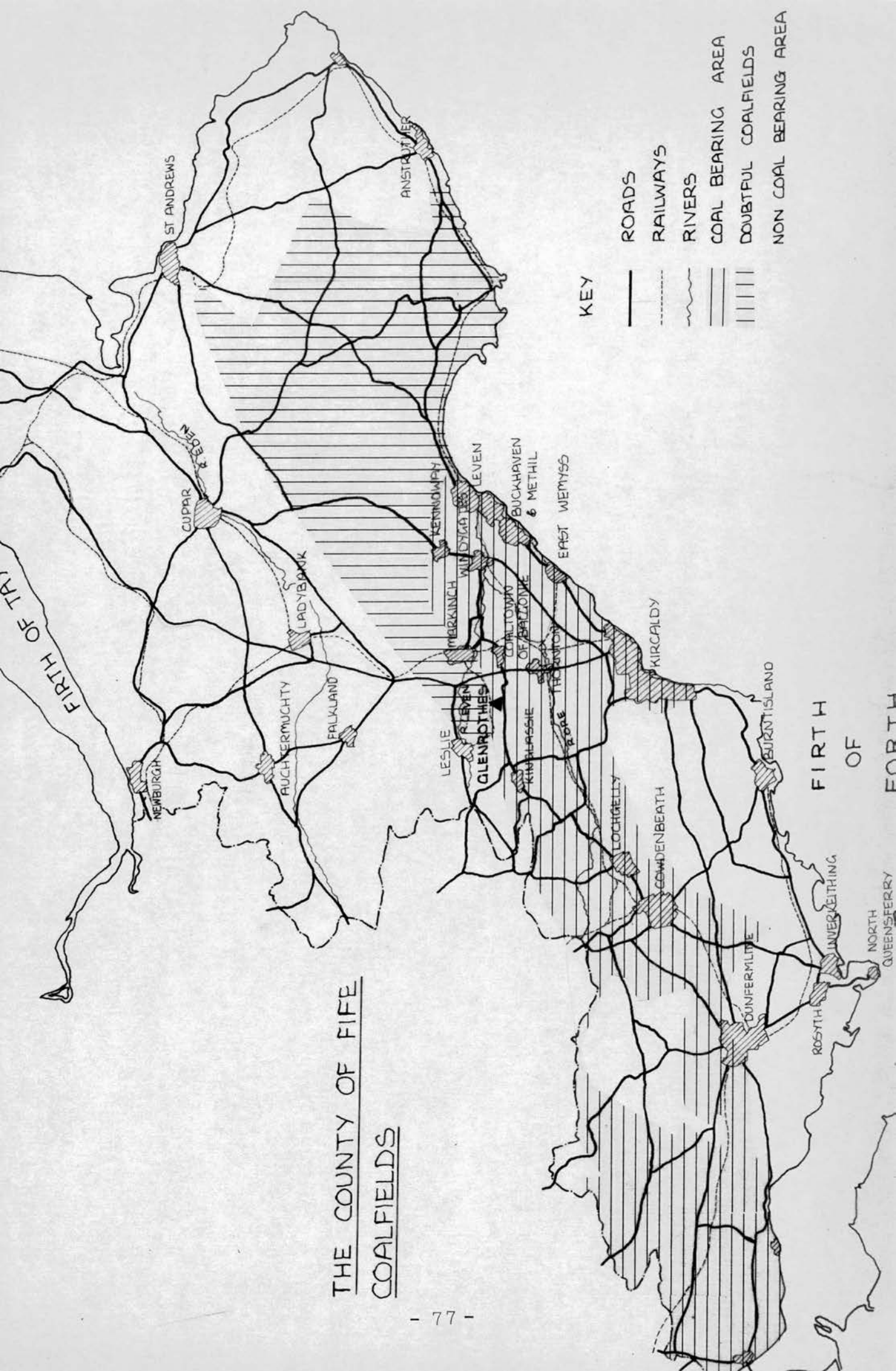
10. Bloom concludes that variations in environment tend to have the greatest effect on I.Q. in the age range 1 to 5 years, and relatively little after 8 (op.cit. pg.68). In this way he agrees with Ignatius Loyola, Lenin and Piaget, on the importance of early experience. However Gordon and Asher have noted significant decreases in I.Q. after that age and Klineberg has noted the opposite amongst Southern Blacks migrating to New York, demonstrating an I.Q. gain of 7 to 8 points after three to four years. Lee (1951) noted a similar situation for those moving to Philadelphia, and also noted the decreasing effect of an improved environment with increasing age.

CHAPTER FOUR

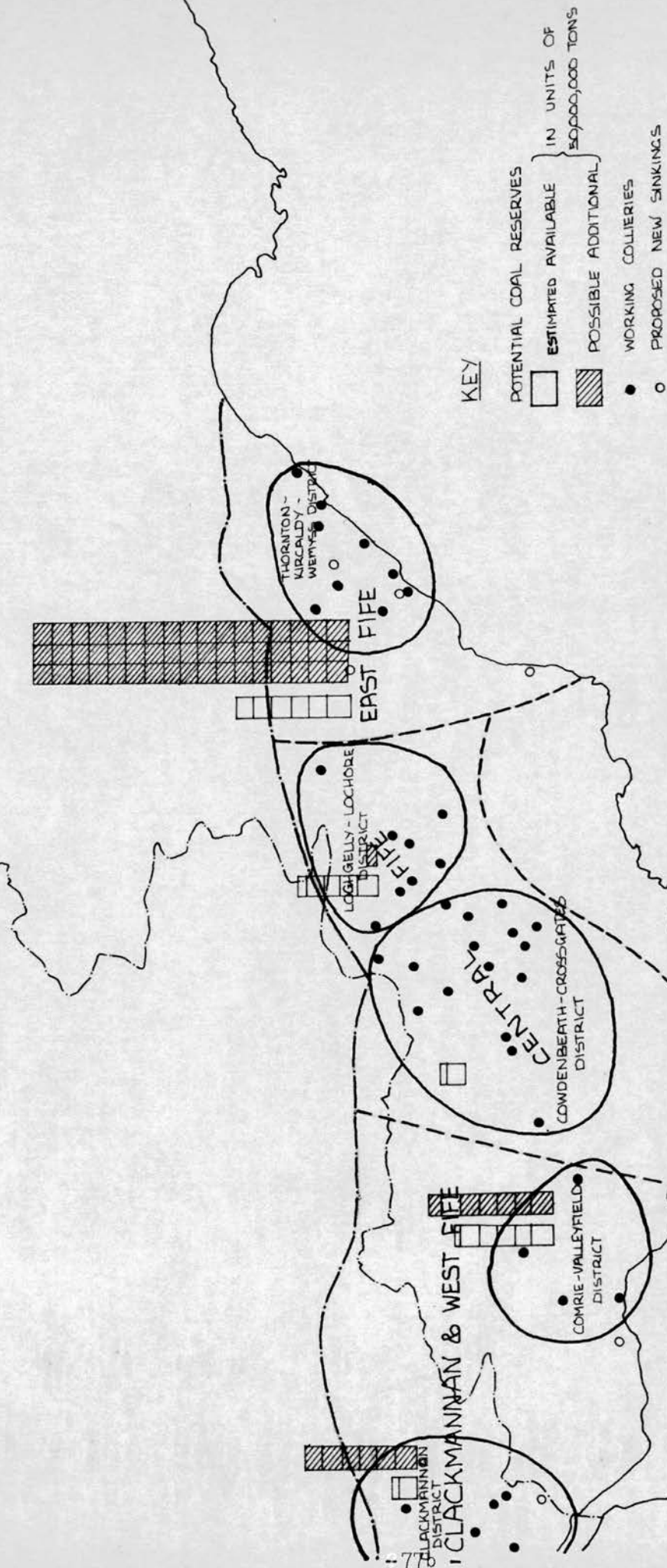
Glenrothes and the Constellation

THE COUNTY OF FIFE COALFIELDS

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Fife - Clackmannan Coalfield : Estimated Reserves 1946



The Development of Glenrothes

After the Second World War the Fife and Clackmannan Coalfield was thought to have the largest reserves in Scotland.¹ The constellation around Glenrothes New Town is on the northern fringe of this coalfield, and the New Town was brought into existence by the demands of the coal industry and the national priority given to extracting energy reserves in the 1940s.

The Report of the Scottish Coalfields Committee was published in 1944.² It noted that production at pits in Central and Western Scotland was declining because workable measures were being exhausted. The Report assumed that it would be necessary to maintain pre-war production levels for Scotland, considered as a whole. It maintained that the Fife coalfield would be the prime area in which the shortfall from pre-war levels could be made up to compensate for the declining Lanarkshire industry. Several new sinkings were anticipated in the East Fife area, the richest part of the Fife-Clackmannan Coalfield, and it was estimated that some 5,000 new miners would be needed by 1975, after taking transfers into account. The Report suggested a figure of 200,000 for the net increase in the population of Scotland's Eastern Coalfields (an area including the Lothians, as well as Fife).

Published two years later, the Report of the Fife County Council Planning Advisory Committee³ anticipated four new large capacity collieries, one at Rothes, one near Dysart, and one South of Kirkcaldy, all to be sunk by the Fife Coal Company, and one to be sunk by the Wemys Coal Company.⁴ The three Fife Coal Company pits were to be fitted for an annual output from 1,250,000 to 1,500,000 tons. The plans for the first of these collieries,

the Rothes, had been approved by the Ministry of Fuel and Power before nationalisation. The Report then went on to comment that "Prior to 1938 the output of coal was controlled not by the capacity of the pits, but by the number of workers' houses." ⁵

In order to remedy this deficiency of housing, the Fife Committee envisaged three major developments in the East Fife Coalfield, each for about 10,000 people. One of these was to be an extension to Kirkcaldy, one a 'New Town' at Kennoway, and the third a similar development in the Leslie-Markinch area. This latter development was also designed to aid the housing and female labour shortages of Leslie's industries. Several minor developments were also planned to meet the expected influx of 42,000 people into the area. The Report also attempted to allocate the responsibility for these developments amongst the 26 housing authorities in the country, but noted that "The number of separate Local Government Authorities creates difficulties in administration in regard to the provision as well as the letting of houses." ⁶

The population predicted by the Fife Report was considerably larger than that of the Scottish Coalfields Report, which estimated a need of only 7,760 houses for the entire county. This figure was criticised in the Fife Report as not taking into account "the additional houses required for the non-mining population who provide the necessary communal services." ⁷

The study of Central and South East Scotland lent support to this position. ⁸ The study noted the imbalance of the employment structure in certain areas, especially where mining and heavy industry were predominant, which resulted in women often having to

travel a long way to work, and a lack of variety of occupations. The study also backed up Fife's plans for three new developments, and also suggested that this was a case for the application of the New Towns Act. The East of Scotland had already been noted as one of the two most suitable areas in Britain for New Towns by the Reith Report.⁹

A New Town of 'moderate' size was suggested by the study, this was to be linked to existing settlements in order to provide facilities not within the power of local authorities. A figure of 30,000 was suggested for the population.¹⁰ This figure was arrived at because it was estimated that 3,700 miners would have to be housed in the area around Markinch and Leslie, and a ratio of at most one miner to eight in the total population was recommended, a high figure indicating that one adult man in every two would be a miner. Mears, the author of the report had apparently used the population of Cowdenbeath, itself largely based on mining as a basis for this recommendation, where the ratio of miners to the rest of the population was at that time (1948) one to eight.¹¹

In the meantime, the National Coal Board had taken control of the nation's mines in January 1947. Shortly afterwards it came up with plans for expanding, let alone maintaining, output.¹²

The Secretary of State for Scotland approved the designation of Glenrothes as a site for a New Town, and on 25th October, 1948, Glenrothes Development Corporation was established. The aims of the town were laid out in the First Annual Report, they centred upon the provision of manpower for the extraction of coal, but also related the need for a balanced community. The Report stated

the town's purpose: "To meet the needs of the expanding mining industry in the county by providing homes for the miners who will be employed in the neighbouring Rothies Colliery, now in the course of construction, and in other collieries. In order to give effect to the aim of a balanced community, the detailed planning of the New Town will be based on a proportion of one miner in eight or nine of the population. In this way, a repetition of the faults to be found in mining communities in other parts of the country will be obviated." ¹³ No details of the faults to be 'obviated' were given.

The original site was of 5,730 acres, of which 28 acres in the South East are still liable to subsidence, because of colliery workings. The plan on the town was not only constrained by the extent of the Rothies colliery, but also by the extent of old workings North of the River Leven. The plan envisaged the location of industry in the Leven Valley in what is now the Queensway Industrial Estate, and also by the Markinch to Leslie Railway Line. Three 'neighbourhood units' were originally planned, one North of the river, and two South. In each of these there were to be developed 'Precincts', each capable of supporting a two class entry primary school, and to some degree focusing upon it. The population estimated as necessary for this was 3,500, and 1,000 dwellings were considered necessary to house them in each precinct. ¹⁴

By constructing the town precinct by precinct, the building and planning programme was made more manageable, giving a short time between the completion of the first and last houses in each precinct. In 1950, building began at Woodside, where the County Council had already built several houses as part of their planned development. The Development Corporation took over from the

County Council and no further council houses have been built inside the designated area.

In the 1950s the development of the town was closely linked with the fortunes of the coal industry and with the Rothes Pit in particular. The Corporation had to struggle to maintain both expansion and occupational balance, in these years of coal's decline. The policy of house letting was largely determined by N.C.B. requirements, the Eighth Annual Report stated that not more than half of the houses in each block were to be let to miners, provided that this did not interfere with N.C.B. plans for transferring miners. The 1950s projections of future coal production were much down on those of the previous decade,¹⁶ and future of the Rothes Colliery was less rosy than that of the entire industry. In 1954, when production was expected to commence, it was still three years from completion. The Development Corporation could not counteract the uncertainties resulting from changing N.C.B. manpower requirements by building factories in advance of requirements as this was not government policy at the time.¹⁷ The Second Annual Report estimated that the population would not exceed 18,000 in the following 25 years, although the plans at that time provided for 23,000.

In 1957 the Rothes Colliery began production, and to the end of the 'fifties' Glenrothes remained primarily a mining town. In 1959 the ratio of miners to the rest of the population was 1 : 7.8.¹⁸

This ratio was not reflected in all parts of the town and the corporation attempted to secure a more even distribution by offering exchanges. By 1960, two precincts had been completed; Woodside and Auchmuty, and third began; Rimpleton in 1958.

After only three years of operation, the decision to run down and close the Rothes Colliery came in 1961. Geological factors prevented its continued functioning. In 1962 it closed completely. The Development Corporation had to look elsewhere for employment and expansion.

Under the 1957 Housing and Town Development (Scotland) Act it had already gained an agreement for 1,800 approved nominees from Glasgow. Immigration from Glasgow was never large, but it was for a time significant.

The expansion of the electronics industry in the early 'sixties enabled the Corporation to attract several firms to Glenrothes. At the end of 1962, the ratio of miners to the rest of the population had dropped to 1:32.¹⁹ Many had left the town or changed jobs. The 1960s saw the greatest expansion of Glenrothes.

Table 4.1 Expansion of New Manufacturing Industry

<u>Year</u>	<u>No of Firms</u>	<u>Total Floor Space (sq ft)</u>	<u>Employment</u>		
			<u>Males</u>	<u>Females</u>	<u>Total</u>
1958	3	38,952	60	50	110
1959	5	92,612	125	100	225
1960	6	131,820	254	229	483
1961	6	144,250	311	319	630
1962	7	226,778	551	389	940
1963	7	289,590	578	452	1,030
1964	11	438,184	976	668	1,644
1965	15	596,738	1,293	1,121	2,414
1966	22	963,403	2,039	1,945	3,984
1967	26	1,008,963	2,299	2,102	4,401
1968	31	1,177,479	2,394	2,262	4,656
1969	33	1,381,644	2,746	3,231	5,977
1970	34	1,407,945	2,789	2,747	5,536
1971	39	1,565,300	2,910	2,676	5,586

Figures relate to 31 December of each year.

Source: Glenrothes D.C. Statistical Data January 1972 p.13

In 1961 the Glenrothes District Council was set up. This enabled elected representatives of the inhabitants to take charge of the maintenance of simple amenities, such as parks and open space, and routine public health matters, such as refuse collection. In October 1963 the population target was raised to 55,000.²⁰ At this time Glenrothes became the principal growth point in the County. It provided alternative employment for those made redundant by the closure of several West Fife Collieries. The growth of Glenrothes enabled Fife to maintain its population throughout the 1960s. Over half of Glenrothes' immigrants came from the County itself.²¹ By 1968 four more precincts had been completed; South Parks in 1964, Macedonia in 1966, Rimbleton, finally, in 1967, and Tanshall in 1968. Construction on two more had also begun; Caskieberran in 1966 and Newcastle in 1967.²²

Car ownership has increased in Britain much faster than was envisaged in the 'forties.²³ New Towns have a much higher level of ownership than the rest of the country.²⁴ This increased mobility enabled the Corporation to decrease the number of shopping areas within the precincts,²⁵ but also led to a further problem. The Eighteenth Annual Report expressed concern over the "Five O'Clock Executive Exit,"²⁶ the same phenomenon as Heraud had noted in Crawley.²⁷ Several of those in upper income groups were buying houses outside the town. In response to this the Corporation began to sell houses to sitting tenants, and to construct houses specifically for sale in the newer precincts.²⁸

The 'Executive Exit' has not been the only way Glenrothes has effected the surrounding area. The new private housing being constructed in Leslie and Markinch may be for commuters working in

Glenrothes, but jobs have also been provided for residents of the surrounding area. Coaltown of Balgonie no longer houses only miners, and the importance of railway work in Thornton has greatly diminished.²⁹

The New Town has established a relationship with the constellation of towns and villages surrounding it. It does provide those amenities called for in the reports of the 'forties.³⁰

All the children from the constellation and a few from beyond go to one of the three secondary schools in Glenrothes.³¹ Roman Catholic children can go to St. Paul's primary school in the town. The technical college, demand for which was much stimulated by the electronics industry, serves the surrounding countryside as well as the town. Glenrothes is also a centre for sports activities providing excellent facilities in many activities, and its shopping centre is of growing importance.

The Present State of Development of the New Town

In 1974, nine precincts in two neighbourhood units had been constructed in Glenrothes, and the population of 31,000 had reached the target of the early proposals, and was well on its way to the target population of 55,000 proposed in 1963. Only in the Northern neighbourhood had no building been done. All that existed in this area was the old village of Cadham which had not been in any way absorbed into the town.

Table 4.2 gives an outline of the salient characteristics of each precinct, and each school serving the precinct.³² There were nine primary schools in Glenrothes, however one of them, St. Paul's caters for the Roman Catholic population of the entire area and does not serve any one precinct. Tanshall Primary School served

Table 4.2.- Outline of the Salient Characteristics of each precinct

Precinct	Woodside	Auchmuty	Rimbleton	South Parks	Macedonia	Tanshall* Newcastle	Caskerberran	Pitteuchar	Town Average
Date of first building.	1950	1952	1958	1960	1964	1966	1966	1970	-
Population in 1973	4,849	6,255	4,391	2,934	3,430	3,950	2,262	2,052	-
No. of Dwellings in 1973	1,109	1,673	1,202	982	967	1,399	901	726	-
Percentage of dwellings flats or maisonettes	6%	25%	3%	10%	9%	26%	24%	3%	13%
Percentage of owner occupiers.	Below 5%	Below 5%	Below 5%	Above 40%	Below 20%	Above 20%	Below 10%	Above 10%	10%
Percentage of white collar workers.	23.2%	14.1%	27%	36%	31%	40%	45.8%	39.4%	
School	Carleton ¹	Warout ²	Rimbleton	South Parks	Southwood	Tanshall	Caskerberran	Pitteuchar East	
Date of completion	1950	1952	1962	1960	1966	1969	1967	1970	-
School roll in 1974	541	765	591	540	617	597	380	289	540
No. of Classes	16	24	18	17	18	18	11	9	-
No. of Staff	19	28	21	20	21	22	15	11	-
Class size-average	34	32	33	32	34	33	35	32	33

1. Albume Park is a small development in the catchment area of Carleton School, not included in Woodside.

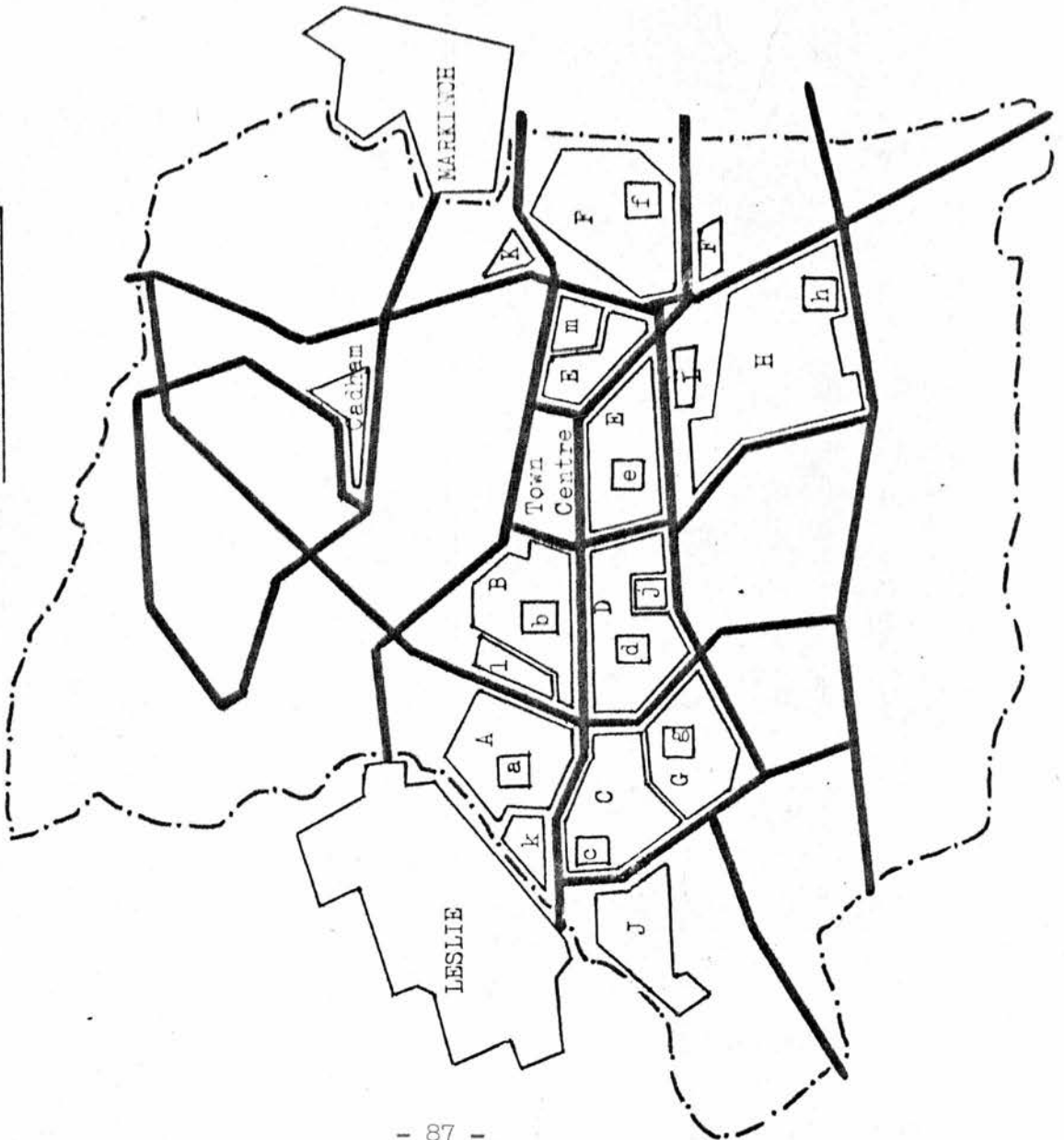
2. Braid Drive is a small development in the catchment area of Warout School, not included in Auchmuty.

3. Pittenchar East Precinct was not completed at the time of the survey, the figures given are for 1973 latest constructions.

* Tanshall and Newcastle are two separate precincts but are both served by the same school. The figures given are for both precincts combined.

Sources: Glenrothes Social Survey 1971 and School Headteachers.

GLENROTHES NEW TOWN



Boundary of the Designated Area - - - - -

Roads —

Schools :

- a Southwood
- b South Parks
- c Tanshall
- d Rimbleton
- e Warout
- f Carleton
- g Caskieberran
- h Pitteuchar
- j St. Pauls R.C.
- k Glenwood High
- l Glenrothes High
- m Auchmuty High

Residential Areas :

- A Macedonia
- B South Parks
- C Tanshall
- D Rimbleton
- E Auchmuty
- F Woodside
- G Caskieberran
- H Pitteuchar
- J Newcastle
- K Alburne Park
- L Braid Drive

both Tanshall and Newcastle precincts. The only other exception to the one precinct: one school rule, occurred at the western end of Rimbleton, whence some 70 pupils attend Caskieberran School because Rimbleton Primary School is fully complemented.³³

There is considerable variation in the size of the precincts, Auchmuty is well over half as big again as Caskieberran, and correspondingly has the only three class entry primary school in the town. With the exception of Pittenchar East, for which the catchment area was incomplete,³⁴ all the other schools in the town operated on the prescribed two stream entry school. South Parks, Rimbleton and Southwood Schools are of identical design.

All these three schools had however pressed special rooms into service as classrooms because of the bulge in pupils which follows the creation of a new precinct.³⁵ Tanshall School catering for two precincts, had erected some temporary classrooms in the playground to cater for this demand. At one time Carleton School had had over 1,000 pupils on its roll compared with its now stable roll of 540. Associated with the bulge in children is the provision of nursery schools or classes. In the years between the construction of the school and the bulge in five to twelve years lies a period where rooms are underused. In Glenrothes these were turned over to nursery use, both Caskieberran and Pitteuchar had diminishing nursery classes, whilst, after the bulge, Carleton had been able to return some classrooms that use. Apart from this phenomenon, the provision of educational facilities did not differ greatly amongst the precincts, class sizes vary from just under 35 down to 32.

Between the precincts there was also a considerable variation in other aspects than size. Owner occupation covered well over 40%

of the households in South Parks, whilst it was below 5% in both Rimbleton and Auchmuty. The town's average was considerably below Scotland's average at under 20% owner occupiers. There was also a marked variation in housetypes between the precincts. The earliest precincts had a high proportion of semi-detached houses, whilst those later ones contained many terraced houses, however the greatest variation was that in flats and maisonettes, amounting to about a quarter of the dwellings in three precincts, yet to only 3% in two. One other and apparently independent variation was that in the occupational structure of the precincts, the early precincts containing relatively few white collar workers, whilst the later precincts contained far more, Newcastle, itself, counted half its heads of households as white collar workers. Such development reflects the changing employment base of the town.

However the figures presented underestimate the middle class presence both in Carleton and Waront Schools and in the early developments in the town although not greatly. Woodside was the first precinct to be constructed, and is based upon the old village of Woodside and the County Council development around it. The Development Corporation houses account for only 60% of the dwellings in this area, (The figures presented in table 5.2 account for all the households). To the north of the main body of Woodside is Alburne Park. There were 45 houses here, 18 reserved for Corporation Staff, and eight for N.C.B. Officials. The remainder were privately owned, some with extensive grounds. There were 124 residents, of whom 85% of the heads of households were in Social Classes I and II, compared to under 15% for Woodside itself.

Braid Drive is a similar development to that of Alburne Park, with a population of 200. Its children go to Warout School, along with the residents of Auchmuty, from whom they are more socially dissimilar than the residents of Alburne Park and Woodside are. Under 15% of the residents of Auchmuty are white collar workers, whilst over 90% of the residents of Braid Drive are. The catchment area of Warout School includes the town centre, where 67 people live.

The numbers resident in the two developments are relatively small, but they do indicate a degree of social segregation backed up by geographical segregation present in the older areas of the town, and not so noticeable in the later areas.

The Constellation

The Constellation of towns and villages aground Glenrothes consists of five settlements; two towns and three villages. Leslie and Markinch are two small burghs and Thornton, Milton of Balgonie and Coaltown of Balgonie three industrial villages. Leslie, Markinch, Milton and Coaltown are situated on or near the River Leven, and Thornton is on the River Ore which runs into the Leven from the South. (see map on page 91)

Although situated on the edge of the most productive coalfield in Scotland, the inhabitants of the burghs of Leslie and Markinch have traditionally made their livings from natural resources other than coal. The water of the Leven Valley has been the most important of these. The regularly flowing water led to the building of flour and textile mills, and these later gave way to paper mills, of which there were three in the vicinity in 1944, one at Leslie, one at Markinch, and the third in between the two towns. Also at Markinch are the headquarters of the Haigh's Whisky, the oldest establishment

The Site of Glenrothes , the Constellation and
South East Fife in 1946



Source : 'Fife Looks Ahead ', p. 31.

in its field. Before the designation of Glenrothes, Leslie manufactured pens and flax and produced more plastics than anywhere else in Scotland.³⁶

Markinch's central position with regard to transport linkages made it a market centre. The railway station at Markinch is sign-posted as 'Markinch for Glenrothes', however the railway which did pass through Glenrothes to Leslie no longer functions.

At designation, the nearest working colliery to Glenrothes was between Coaltown of Balgonie and Thornton, about a mile from each. However seven other deep bores were known to exist between the Rivers Ore and Leven, where the Rothes pit was to be sunk.³⁷ Both Coaltown and Thornton were created as a result of 19th Century industrialisation, the former, as its name implies, was based on coalmining, and the latter on the railways.³⁸ Milton is a small village, possibly of agricultural or mill origin, whose inhabitants are now almost entirely industrial workers.³⁹

Inside the designated area lies the small village of Cadham. Although this is to be integrated into the Northern neighbourhood of Glenrothes, in 1974 it was completely separate from the New Town and its main lines of communication lay along the Leslie-Markinch road. Children from Cadham went to primary school in Markinch. It was treated as part of the constellation.

Until local government reorganisation, the burghs of Leslie and Markinch had contiguous boundries with the designated area. The roadside sign indicating Coaltown of Balgonie is only a few yards down the road from another sign indicating the New Town to travellers going the opposite way. Thornton and Milton of Balgonie are one and two miles distant respectively.

Table 4.3. Outline of the Constellation

Town or Village	Leslie	Markinch	Thornton	Coaltown of Balgonie	Milton of Balgonie	Average
Population 1971	3,323	2,225	2,075	935	357	-
School Roll 1974	418	297	242	116	42	223
No. of Classes	12	9	7	5	2	-
No. of Staff	14	11	8	5	2	-
Av. Class Size	35	33	34	23	21	32

Source: Census of Scotland, 1971 and School Headteachers.

The Local Education Authority

Until the reorganisation of local government, education in Fife was administered by the Fife County Council. After the reorganisation it was administered by Fife Regional Council. The survival of the ancient 'Kingdom' was only achieved after a long political battle. This victory of Fife particularism enables pre-reorganisation figures to be used when describing present facilities, because the boundaries have not changed.

The resources available to the County were below average for both Scotland and Great Britain. Pratt estimated that 25 out of the 38 Scottish Educational Authorities had more resources per capita than Fife.⁴⁰

In the County both nursery and further education were priorities in their allocation. In 1973 no other County in Scotland had a higher proportion of nursery places, with 15.2% of the age group receiving nursery education, a figure over six times the average for England and Wales.⁴¹ In the same year the County gave more discretionary awards for further education than any other County.⁴² Such a pattern of spending supports the thesis of Byrne and Williamson that working class and Labour controlled authorities spend resources in a non-elitist fashion. However a higher proportion of Fife children got S.E.D. awards than the average for Scotland,⁴³ something which would conflict with the results their hypothesis would expect.⁴⁴

Fife's lower resources were reflected on below average spending on primary education, than that of most Scottish Local Education Authorities⁴⁵ which resulted in a less favourable pupil teacher ratio than the national average.

The index of resources is also an indicator of the socio-economic make-up of the population. The County spent more on education than would have been expected from national trends, given its resources, and the success of the children from Fife was also higher than would have been expected, on the same basis, from its social and economic structure.⁴⁶

There are certain resources which are scarce in all local authorities, and have to be distributed as fairly as possible. Teachers of special subjects such as art, drama, music and physical education have to travel round a circuit of schools, spending from half a day a fortnight to a day a week at various schools. Central storerooms distribute films and recordings when they are needed to each school and then gather them again for when they are next needed. Not every school can be provided with a school kitchen and so meals are sometimes delivered from central kitchens.

In order to assess the need for remedial teachers and for nursery places, the Education Authority has used the results of attainment and IQ tests from the schools of the County. Since 1969 tests have been administered to seven year olds in all the schools in the County to determine where the greatest need lies.⁴⁷

The Education Authority has also used the results of verbal reasoning tests⁴⁸ taken at ten and eleven in order to give guidance in the Secondary School. Although largely a hang-over from eleven plus days, they continue in use in order to provide an estimate of the child's ability to the Secondary School teacher.

1. 'Fife Looks Ahead', The Report of the Fife County Council Planning Advisory Committee, C.J.Cousland & Sons.Edinburgh 1946. p.31.
2. Scottish Home Department, 'Report of the Scottish Coalfields Committee'. H.M.S.O. 1944.
3. Op.cit.
4. Op.cit. p.32.
5. Op.cit. p.31.
6. Op.cit. p.66.
7. Op.cit. p.33.
8. Mears.F.C. 'A Regional Survey and Plan for Central and South East Scotland' Edinburgh. 1948.
9. Interim Report of the New Towns Committee p.7. para.8.
10. The Reith Report had already anticipated such populations for developments in the remoter areas of Scotland, and although lower than the population ascribed to most of the other New Towns, it was well within the 20,000 to 60,000 range suggested by the Interim Report. op.cit. p.4. para.2.
11. 'Fife Looks Ahead' p.212.
Between 1945 and 1954 the output of saleable coal mined in Britain
12. increased from 174.7 million tons to 214.0 million tons.
13. Op.cit.
14. Outline Plan of Glenrothes. 1959
15. See later this Chapter.
16. The Seventh Annual Report (1956) referred to changes in the population estimates of the Department of Heath for Scotland following the re-estimation of manpower requirement by the National Coal Board and estimated that the towns population was not likely to exceed 18,000.
17. Industry existing prior to the designation of the New Town consisted of two paper mills and one bleach works. The latter closed in 1958.

18. Tenth Annual Report.
19. Thirteenth Annual Report.
20. The Seventeenth Annual Report (1966) indicated an envisaged population of 95,000 at the end of the century.
21. Glenrothes Development Corporation: 'Statistical Data' January 1972. p.3.
22. 'Statistical Data' op.cit. p.21.
23. In the first New Towns after the war garage provision was limited to one garage for every twelve dwellings. In the newest areas of some New Towns there is now a one to one ratio of cars and dwellings. e.g. Redditch's most recent development of Winyates slightly exceeds this figure. Redditch household Survey 1975.
24. Census of 1971.
25. Eighth Annual Report.
26. Op.cit,
27. See Chapter One. pp8-9 and Heraud.op.cit.
28. The Newcastle Precinct, which was the last to be completed includes a very high proportion of such houses; see Table 4.2 the bulk of the owner occupiers in the Tanshall/Newcastle area live in Newcastle.
29. The decline of these two sources of employment has occurred nationally, and the alternative employment found in Glenrothes has helped to maintain an employment balance in the locality.
30. See earlier this Chapter.pp.79-81.
31. There are three Secondary Schools in the New Town: Glenrothes High School, formerly a Senior Secondary School, Auchmuty High School, formerly a junior Secondary School and Glenwood High School from which pupils transfer to the Glenrothes High School at 16. With the expansion of the town this school is expected to take children up to 17 or 18 years of age.

32. Also shown on Map 4.2 and Street Map in Appendix VI
33. This was dealt with in the analysis by separately coding precincts and schools for each child. See Chapter 11.
34. The precinct was still being built in 1974.
35. This bulge is temporary, as it is the result of the age structure of the area, which contains disproportionate numbers in the 20 - 35 age group and hence the 0 - 10 age group as well. It should be distinguished from the phenomenon of larger families in East Kilbride noted in Chapter 1.p.12.
36. 'Fife Looks Ahead' pp.38 - 56.
37. 'Fife Looks Ahead' pp.30 - 34.
38. Thornton is situation on the main Edinburgh to Dundee line at the junction of branch lines to Kircaldy and the South Coast of Fife and former branches to Wemyss, Buckhaven and Methil and the East of Fife.
39. Census 1971.
40. Pratt, Burgess, Allemano & Locke, 'Your Local Education', Pelican 1973. Table 65. On their resources index Fife rated 1.85 compared to Edinburgh's 2.49 and Glasgow's 1.96. Caithness was bottom of the list on a rating of 1.71.
41. 16 of the Scottish Counties had no nursery provision at all. Only two of the four Cities in Scotland had a higher level of provision than Fife; Aberdeen and Edinburgh each with just over 20% of the three to five age group attending nursery schools. op.cit. Table 68. The average for England and Wales was 2.4% of the same age group at nursery school. op.cit.p.89.
42. Op.cit. Table 69.
43. Op.cit. Table 69.
44. See Chapter Two p.53.
45. The average number of pupils per teacher in primary schools in Fife was 26.2, which was a higher figure than those in 24 of the 38 Scottish Local Education Authorities. op.cit. Table 66.

46. Income levels in Fife are below both the Scottish and U.K. averages.

The Distribution of Incomes and Income Inequality
in the U.K. Scotland and Fife

Deciles	1	2	3	4	5	6	7	8	9
	<u>Yearly income in pounds</u>								
U.K.	607 779		963	1140	1327	1529	1760	2069	2709
Scotland	591 711		917	1084	1270	1481	1708	1978	2641
Fife	567 705		852	1034	1168	1369	1581	1810	2445

Source: Inland Revenue, "Survey of Personal Incomes 1970-71"
(1973) Regional Table pp.122-123.

47. For a fuller description, see Appendix I.

48. For a further description, see Appendix I.

Chapter Five

The Methodology and the Research Procedure

The six hypotheses laid out in Chapter Three¹ deal with the relationship between a dependent or criterion variable; educational attainment, and several independent variables, such as social class, length of residence and reason given for last move. These relationships were constructed in such a way that the research design set out below enables each of them to be falsified.²

Whilst it would have been desirable to reformulate those hypotheses which needed further clarification, with a view to extending the investigation, it was not possible to do so within the restrictions placed upon this piece of research, by the lack of both money and time. However other relationships which are worthy of both comment and further investigation can be explored using the data. Some of them concern relationships between variables, none of which is educational attainment. Investigation of such relationships will lack the rigour of the investigations of the original hypotheses, but it is hoped will nevertheless serve a useful purpose.³

In order to proceed with the investigation a suitable New Town and comparison area had to be selected. Access to comparable information on the attainment and social background of a sample of children was necessary for both areas. Information of this kind was available for Glenrothes and the surrounding areas.⁴ The area selected for comparison was that of the 'Constellation' surrounding Glenrothes. It is also within the Region of Fife and hence the same Education Authority as the New Town. By selecting these areas, differences in the standard of provision and the level of attainment between authorities were controlled for. Such controls would seem to be particularly important in the light of the work of Byrne and Williamson.⁵

Over half of Glenrothes' immigrants come from the surrounding

region and the Constellation has been the origin of the highest proportion these immigrants.⁶ The social structure of the area⁷ is also similar to that of Glenrothes, and easy access is available to the industries of the New Town.⁸

However its physical structure differs considerably, the Constellation being made up of five separate units, the towns of Leslie and Markinch, and the villages of Thorton, Coaltown of Balgonie, and Milton of Balgonie. These are all much smaller than Glenrothes, but are much closer in size to typical developments in the region. School sizes reflect this, those of the Constellation are on average about 10% smaller than the county average, whereas those of Glenrothes are on average over 50% larger.⁹

The Constellation is representative of the environment from which most of Glenrothes' immigrants have come. Its deficiencies are those which the creation of the New Town was meant to remedy.¹⁰

The Data available from official sources

There were several sources of information available about Glenrothes, the Constellation and their schools.

- (i) Attainment scores held by the Education Department.
- (ii) Social Surveys conducted by Glenrothes Department Corporation.
- (iii) The Quarterly Returns of the Glenrothes Area Office of Fife Region Social Work Department.
- (iv) The Scottish Education Department Record Cards for each pupil, held at the schools, and other school records.

(i) The Attainment Scores

The education Authority administers two series of attainment tests to its primary school pupils. The first series is administered at the age of seven, after two years primary education and consists of

tests in Picture Intelligence, Reading and Mathematics. There have been traditionally two intakes of children into primary school in each year, in February and August. Correspondingly there are two occasions in each year when tests are given to seven year olds, in March and October. Children commencing primary education in February 1968 were tested in March 1970 and children commencing primary education in August 1968 were tested in October 1970. From 1969 to 1972 these tests were administered to all the children in the County, since which time a sample has been taken from each school.

The second series of tests consists of two verbal reasoning tests taken by all children, one in each of the children's last two years at primary school.

The results of these tests were kept in the Regional Education Office. Also available were the average quotients on each test administered to seven year olds for each school, and the proportions of pupils in each school scoring over 20 points above or below the mean for each of the tests administered since October 1969.¹¹

(ii) Social Surveys Conducted by Glenrothes Development Corporation

The Department of Architecture, Planning and Quantity Surveying of Glenrothes Development Corporation made available the results of three recent surveys carried out by them. These included the 1971 Household Survey of 10% of households in the town, on which answers to a variety of questions on household structure, home facilities and activities were gained for 88% of the sample households. The other survey results made available were of adult leisure activities and children's play facilities on a precinct by precinct basis. The Corporation also provided updated information on demography and social structure in their annual analyses of immigrants and emigrants

for each year up to 1974. All this information was available on an aggregate precinct by precinct basis.¹²

(iii) The Quarterly Returns of the Glenrothes Area Office of the Fife Region Social Work Department

The Glenrothes Area Office of Fife Region Social Work Department was responsible for social work in both Glenrothes and the Constellation. They made available their quarterly returns of caseload and casetype for each subdivision of the area, which corresponded to the precincts of Glenrothes and the towns and villages of the Constellation.

The returns were available up to October 1974.¹³

(iv) The Scottish Education Department Record Cards and other school records

Record cards are kept for each pupil in Scotland at a local authority school, and transferred with the pupil to his or her new school when the child changes schools. They contain information on the pupils' educational history, e.g. primary schools attended and the dates of transfer, and also information on paternal occupation, family size and birth order.

The other school records concerned nursery school attendance, meals taken, attendance and composition of class.¹⁴

The data available from official sources provided adequate information on attainment for primary school pupils in Fife and was also adequate in providing social background information for the various areas covered by the research. However it provided only the smallest insight into the home backgrounds of pupils in the County. Information on characteristics of the schools themselves was also meagre at the Education Offices.

Of the eight factors described in Chapters Two ¹⁵ and Three ¹⁶ which have strong associations with educational attainment, adequate information existed on three: Family Structure, Social Class and Neighbourhood Characteristics. Data on the other five major factors which determine children's educational attainment was lacking. In order to adequately evaluate the hypotheses it was necessary to collect information on the home amenities, income, the extent of parental aspiration and encouragement, the level parental educational and literacy, and the schools attended by the children.

This information was required in order to determine those differences between the two areas which might account for any observed differences in educational attainment between Glenrothes and the Constellation.

In order to remedy the deficiencies in the information needed to investigate the hypotheses, fieldwork was necessary. It was necessary to interview the headteachers of the schools to determine the characteristics of those schools. It was also necessary to gain more information as to the home backgrounds of the pupils themselves. Before proceeding to interview the teachers or elicit any information about the children it was necessary to select a sample.

The basic sampling frame was taken to be the pupils in the primary schools in Glenrothes and the Constellation. This included 14 schools, nine in Glenrothes and five in the Constellation. Amongst the nine Glenrothes primary schools was St. Paul's Roman Catholic Primary School, serving Roman Catholic families in both Glenrothes and the Constellation. Because of its lack of a clearly defined local catchment area, St. Paul's was removed from the sampling frame. There were no private or special schools in either of the areas.

It was decided to select all the children born in 1962, who attended any one of the 13 schools in Glenrothes or the Constellation, and who had been resident in Fife for at least 12 months prior to October 1973 (the date the second of the two tests of verbal reasoning was administered). Children in this age group, who had been at schools in Fife from 1969 onwards, would have taken the three attainment tests at the age of seven, (in 1969 or 1970) and the two tests of verbal reasoning at the ages of ten and eleven (in 1972 and 1973 respectively). Attainment scores on all the tests administered to primary school children were therefore available for children in this group. The sample numbered 679.

Data Collection

Data was collected in two forms, for each of the 679 children in the sample and in aggregate form for each school, precinct, town or village.

(i) Data Collection for the sample of pupils

The scores and quotients on all the tests taken by pupils in the sample were obtained from the Regional Education Authority,¹⁷ the data on the S.E.D. Record Cards and on other school records¹⁸ were obtained from the schools the children attended, and the home background information was elicited by a questionnaire.

This questionnaire was designed to elicit information on those areas of home background relevant to educational attainment noted in Chapter Two. In this way the deficiencies of the official records were rectified and checks on such characteristics as paternal occupation and family size introduced, thus providing a measure of the reliability of the questionnaire. Information concerning length of residence in the present location and the reason for the last move

was also asked for.

The information gained from the questionnaire can be summarised under the following headings:

- (i) Home Amenities, such as the possession of an indoor toilet, but also such commonplace modern amenities as a telephone and central heating.
- (ii) Parental aspirations and encouragement for the child, including the extent of help with homework and the number of visits to school.
- (iii) Parental education and literacy, including, the ages at which parents left school and frequency of library visiting.
- (iv) Family Structure, including family size, birth order, and absence or disablement of a parent.
- (v) Social Class, and the present employment and occupations of both parents.
- (vi) Length of residence in both dwelling and locality.
- (vii) Reasons for last move.
- (viii) Other indicators of behaviour, such as contact with relatives and membership of formal organisations.¹⁹

A sample size of 679 ruled out face to face interviewing. (A much smaller sample would have presented statistical difficulties) The information listed above had therefore to be gained from responses to a questionnaire.

In constructing the questionnaire, it was considered prudent to omit any question on income as this would probably have reduced the response rate.) The questionnaire was piloted on a sample of school children from two schools in Livingston, a more recent New Town situated in the Lothians.

In survey, the children were given the questionnaires together with a covering letter in an envelope by their class teacher and told to return them to the school one week later. The questionnaires were

hopefully taken home by the children to their parents who then filled them in. The class teacher collected the returned questionnaires and gave reminders to those children who had not return a questionnaire.

This procedure was found to be satisfactory, and was followed in Glenrothes in June of 1974, when a revised questionnaire was given out by the class teacher in each of the thirteen schools.

(ii) The Collection of Aggregate Data

The average scores on each of the three attainment tests administered to seven year olds for each of the years 1969 - 1974 recorded for each school, as were the average verbal reasoning quotients for 1973 and 1974. The proportions of high and low scores on each of three tests taken at seven were also recorded for each school.²⁰

33 characteristics of each precinct were extracted from the Glenrothes Development Corporation Surveys²¹ and nine further items were obtained from the Quarterly Returns of the Social Work Department.²²

Information on some 31 characteristics was gained from the schools by way of a structured interview with each headteacher. Access to and other school records was granted. The characteristics of the staff, the rate of turnover of the pupils, the standard of the amenities, school policy and the size and structure of the schools were ascertained from these sources.²⁸

The Analysis

All the data collected was stored on disk at the Edinburgh Regional Computing Centre. Files were prepared for the aggregate and the individual data. Files were prepared for each school, on which aggregate attainment data, gained from the Education Department, and characteristics gained from the schools themselves were stored. These were then combined with data files prepared for each neighbourhood,

which contained the aggregate data from the Social Work Department and from the Development Corporation.

Individual files were made for each of the pupils, and these contained the information gained from the returned questionnaires along with the individual attainment data, drawn from the Education Department, and the individual characteristics extracted from the school records. It was possible to add data to all the files, and this enabled aggregated data from the individual pupil files to be added to the neighbourhood/school files when appropriate, and similarly for neighbourhood/school aggregate data to be added to the pupil files. All the data processing and analysis was done using the S.P.S.S. package of programs.²⁴

The scheme of the analysis followed that set out in the addendum to Chapter Three, where the six hypotheses were related to the three models for attitude change.²⁵ The test scores were either normally distributed or could be readily converted to a normal distribution,²⁶ and thus enabled parametric²⁷ techniques such as T-test and Analysis of Variance to be used. These techniques along with regression (both parametric and non parametric) and Chi-Squared tests formed the basis of the statistical analysis.²⁸

The six hypotheses were investigated in their numerical order, because of the dependence of the later hypotheses on the earlier.²⁹

The First Hypothesis (The level of educational attainment of children in a New Town will be higher than that of a socio-economically comparable population) investigated the contention that children in New Town tend to have higher educational attainment than children elsewhere,³⁰ but also whether this was associated with the social structure of the New Town in question. The corroboration of this

hypothesis enabled the investigation of possible determinants of such an advantage. (i.e. home, school and neighbourhood characteristics).

The Second Hypothesis (Differences in the level of educational attainment between Social Classes will be smaller in the New Town than in a comparable population) is independent of the First Hypothesis, but it served to clarify the nature of any differences in mean levels of attainment between Glenrothes and the Constellation. It is concerned with the relative importance of social class in accounting for the range of educational attainment in the two areas. The corroboration of this hypothesis enabled investigation to proceed on differences between the two areas in stratification by other characteristics such as home amenities and parental attitudes.

The Third Hypothesis (The different reasons given for moving to a New Town will indicate differences of attitudes and behaviour and hence attainment amongst the children of those moving) assumes that the reasons given for moving to a New Town indicate differences of attitudes and behaviour and that these attitudes influence the children's educational attainment.

The intent of this hypothesis was to determine whether or not characteristics (relevant to educational attainment) of those attracted to the New Town were different from those of a comparison population. Although independent of the first two hypotheses, it serves to determine to what degree any difference in the attainment levels of the pupils in Glenrothes and the Constellation can be accounted for by the different characteristics of that population attracted to move to the New Town. The corroboration of this hypothesis enabled an investigation of possible antecedents of the association to proceed and also an investigation of any differences in educational attainment accounted

for by the different reasons for moving given by residents of the Constellation and Glenrothes.

The Fourth Hypothesis (within similar social and economic circumstances educational attainment will correlate with length of stay in the New Town) is dependent upon the corroboration of the First Hypothesis and was intended to investigate the contribution of the New Town environment to improvements in educational attainment on the assumption that the longer spent in the environment, the greater the effect it would have on educational attainment.³¹ However any effects of the New Town environment on educational attainment occur after the move to the town. Any differences in educational attainment accounted for by the different characteristics for the population attracted to the New Town (as investigated under the Third Hypothesis) are therefore antecedent to the effects of the New Town environment itself, i.e. if an attainment difference is accounted for by the reasons given for moving, it is independent of the length of stay in the New Town environment.

The Fifth Hypothesis (The longer the residents have been in the New Town, the smaller the differences in educational attainment between the Social Classes will be) is dependent upon the corroboration of the Second Hypothesis and was intended to investigate the contribution of the New Town Environment to a diminution of social class differences in the New Town, on the same assumption as for the Fourth Hypothesis that the longer spent in the environment, the greater effect it would have on educational attainment.

The Sixth Hypothesis (Educational attainment will be positively linked to both the age and the social structure of the precinct) is dependent upon the First Hypothesis.

However it served to initiate an evaluation of school and neighbourhood characteristics, and the relative importance of differences between schools and neighbourhoods on the one hand and the differences between Glenrothes and the Constellation on the other. The scheme of analysis is intended to provide a rigorous evaluation of the six hypotheses and a springboard for other relevant background investigations. In concluding it is necessary to give more weight to the hypotheses corroborated and models supported, but explanations of the falsification of the other hypotheses are valuable in providing a basis for possible future investigation. Whilst the investigation is structured around the hypotheses, the research is intended to answer as many of Popper's 'Why's and 'Whynot's as to the corroboration or falsification of the hypotheses, and these are presented in the conclusion.

NOTES

1. p
2. In this way an attempt was made to structure the initial investigation upon the premises laid down by Karl Popper in 'The Logic of Scientific Discovery.
3. This method of explanation is in line with that viewpoint put forward by Dilthey that psychology and the Social Sciences can not be properly explained in the manner of the physical sciences. In this work, both methods of explanation, the 'Verstehende' of Dilthey and the Scientific of Popper, are attempted, but the emphasis is on the latter whenever possible.
4. p
5. See Chapter 2, p.53 and note 88.
6. 52.4% of families resident on 31.12.70 had origins inside the County of Fife: Glenrothes Development Corporation, 'Statistical Data 1972'.
7. See Chapter Six, Table 6.9
8. See Chapter Four, p
9. See Chapter Four, p
10. These deficiencies were frequently mentioned in reports up to designation, see Chapter Four, pp.
11. For a fuller description of the tests see Appendix I
12. See later this Chapter and Appendix I
13. See later this Chapter and Appendix I
14. See later this Chapter, Chapter Six p. and Appendix I.
15. Chapter Two pp.44. - 54.
16. Chapter Three p.
17. See Appendix I for the form in which they were recorded.
18. For all characteristic gathered see Appendix I and Chapter Six.
19. The Questionnaire used is displayed in Appendix I.

20. For all the characteristics gathered see Appendix I
21. For all the characteristics gathered see Appendix I
22. For all the characteristics gathered see Appendix I
23. For all the characteristics gathered see Appendix I
24. 'Statistical Package for the Social Sciences', Nie, Bent and Hull, McGraw - Hill 1970.
25. Chapter Three pp.
26. This was a simple procedure using the SPSS package, see Appendix I and Appendix V.
27. Parametric Techniques require an approximately 'normal' distribution of the variable under investigation.
28. A full description of these tests and their use in the analysis is given in Appendix V.
29. See also Chapter Three
30. See Chapter One.
31. See Chapter Three. Klineberg has noted the improved educational performance of Southern Blacks moving to New York upon some length of residence in the town. Lee has supported this position with further empirical evidence. He followed several groups of Black children in Philadelphia, Pennsylvania, with repeated tests until grade 9. Children born in Philadelphia maintained about the same scores from grades 1 to 9. Children born in the Southern States of the U.S.A. moving to Philadelphia by the age of six gained an average of $6\frac{1}{2}$ I.Q. points from grades 4 to 9, whereas children born in the South, moving to Philadelphia by grade 6 gained only 2 I.Q. points during the period grades 6 to 9. (Lee E.S. 1951. 'Negro Intelligence and Selective Migration: A Philadelphia test of the Klineberg hypothesis.' Am. Social Rev., 16, 227-233.) Bloom has noted of this study that the group used shows decreasing levels of intelligence with increase in length of time spent in the South, but also pointed out the decreasing effect of an improved environment with increasing age. Op.cit pp.75-76. See also Chapter Two p.41, for 'Vernons' comments on coloured immigrants to the U.K.

Chapter Six

The Data

The Sources

There were six sources of information:

- (i) The scores on attainment tests, from the education department.
- (ii) The school records; from the schools.
- (iii) The headteacher interview.
- (iv) The parental questionnaire.
- (v) The survey results from the Development Corporation.
- (vi) The quarterly returns, from the Social Work Area Office.

Information concerning individual children came from the first two sources and from the parental questionnaire. The information gained from the other three sources concerned only information about school or precinct or area characteristics.

The sample consisted of 679 children, all born in 1962 and resident in their present locality for one academic year.¹

(i) The Test Scores

Children in Fife primary schools are subjected to two series of attainment tests, the first at the age of seven, consisting of tests of picture intelligence, mathematics and reading, and the second at the ages of 10 and 11 consisting of tests of verbal reasoning.² All children born in 1962 and in this sample had taken the latter two tests, but not all had been administered the first series. This could have been an account of three circumstances; they could have been absent from school on the dates when the tests were administered, or they could not have then been in the county, they could have moved into Fife after the age of seven. Thirdly, they may have missed the tests because they were born in the first four months of 1962. October 1969 was the date on which these tests of attainment were first introduced. They were designed to be taken by children with two years primary education, i.e. children starting school in August 1967, and thus excluded children

starting school in February 1967, i.e. children born in the last two months of 1961 and the first four months of 1962. The children born in the fifth to tenth months of 1962, entered school in 1967 and took the first series of tests in October 1969. Children born in the last two months of 1962 entered school in February 1968 and so were administered the first series of tests in March 1970. The tests taken in October 1969 and March 1970 were similar but not identical.

Table 6.1 Percentage of Children born in 1962 taking the attainment tests at Seven Years of age

		No.
Picture Intelligence Test	54.9%	(372)
Reading Test	56.0%	(379)
Mathematics Test	55.8%	(378)

Table 6.2 Percentage of Children born in the last eight months of 1962 taking the attainment tests at seven years of age

		No.
Picture Intelligence Test	82.5%	(372)
Reading Test	84.0%	(379)
Mathematics Tests	83.3%	(378)

Almost three times as many children were tested in October 1969 as in March 1970.

Table 6.3 Number of Children being tested in October 1969 and March 1970 on the three attainment tests

	October 1969	March 1970
Picture Intelligence Test	270	102
Reading Test	273	106
Mathematics Test	274	104

The majority of those who had not taken the tests at seven years of age had not then moved into the county. The others had been missed through illness or some other mishap.

Also obtained was the average quotient on each test administered to seven year olds for each school, together with the proportion of pupils scoring either over 20 points above or 20 points below the mean, for each testing from October 1969 to March 1974. The average quotients

for each school on tests of verbal reasoning for 1973 and 1974 were also recorded.

(ii) The School Records

15 characteristics were extracted from the school record cards.³ In several cases, not all 15 characteristics were available for each child. Table 6.4 indicates those instances in which the characteristics were available.

Table 6.4 Inclusion of information in School Records for each child

<u>Characteristic</u>	<u>No.</u>	<u>%</u>
1. Sex	679	100
2. Date of Birth	679	100
3. Date of entry into present school	647	95.5
4. Date of entry to a school in Glenrothes.	637	94.0
5. Date of commencement of primary education.	577	85.0
6. Number of previous schools	571	84.5
7. Attendance at nursery school.	138	20.4
8. Absence	614	90.5
9. Whether in mixed age class.	71	9.5
10. Meals taken.	77	11.2
11. Father's occupation.	650	95.7
12. Mother's occupation.	162	23.9
13. Family size.	647	95.3
14. Birth order.	641	94.4
15. Lack of natural parent. *	59	8.7

* On this point, no negative information was available i.e. on the presence of both natural parents. The figure represents those cases in which the lack of one parent was indicated.

Five of the characteristics were available in less than 80% of the cases. Of these five, two: (13) Mother's Occupation and (15) Lack of Natural Parent were available from the parental questionnaire and the information from this sources was therefore used only for the purposes of cross-checking and for filling in blanks in the information

gathered from the questionnaire.

No other source of information for the low-response items was available. Characteristics (7) Nursery Education, (9) Whether in a mixed age class, and (10) Meals taken were therefore omitted from any analysis.

(iii) The Headteacher Interview

These were carried out in all 13 schools, and some 40 school characteristics were obtained from the teachers and from school records regarding such facets as pupil turnover and rate of absence. These were all satisfactorily carried out and a full list of characteristics used is given in Appendix I.

(iv) The Parental Questionnaire

This questionnaire is set out in Appendix I. It consisted of 52 questions. Of the 679 questionnaires distributed, 526 (77.5%) were returned, of which 424 (62.4%) had been completed. In the case of several questions, no answers were given on otherwise completed questionnaires. For 37 questions, 418 or more had answered them, i.e. over 98.5% of the returned questionnaires. The rates for the other 15 are given in table 6.5.

Table 6.5 Response Rates for the 15 least Answered Questions
in the Parental Questionnaire

<u>Question Topic</u>	<u>No.</u>	<u>%</u>
School leaving age of husband.	400	94.5
No.of library visits of husband.	404	95.5
Disabled husband.	383	90.5
Disabled wife.	394	93.0
Child's expected school leaving age.	412	97.5
No.of school visits: husband.	335	79.9
No.of school visits: wife.	408	96.0
Visit to school without invitation:husband.	348	82.2
Visit to school without invitation:wife.	405	95.5
Helped with schoolwork: husband.	365	86.5

Textbooks bought.	407	96.5
Contentment with child's progress.	412	97.5
Contentment with school.	415	98.0
Reason for last move.	384	90.5
Locus of leisure activity.	403	95.0

11.9% of respondents indicated the lack of one natural parent.

In most cases these were one parent families without a father, and questions about the husband's activities were not applicable. Thus the low response rates on six questions where information about the husband was requested can be plausibly explained.

Of the 15 characteristics noted above, all were elicited as a result of multiple choice answers, and amongst the possible answers to 12 of them was the choice of a non-affirmative answer, e.g.s:⁴

5. Until what age do you expect your child to remain at school?

16

17

18

Don't know.

6.(i) How many times have you visited the school in the last twelve months?

(PLEASE TICK ONE BOX EACH)

Husband

Wife

Not at all

Once

Twice

Three times

4/6 times

More than this.

(ii) Have either of you gone to see your child's teacher or headteacher without an invitation? (PLEASE TICK ONE BOX EACH)

Husband

Wife

Yes

No

8(iii) What was the main reason for your last move?(PLEASE TICK ONE BOX ONLY)

A better job

A better house

A better enviroment

Other reasons

It is plausible that several respondents did not signify these choices, when in fact they were appropriate. It is notable that questions with such multiple choice answers, when addressed to the husband produced the lowest response rates, e.g. number of school visits by husband.

The above two explanations can account for the low response rates on 14 of the 15 questions. The remaining question on the 'Locus of leisure activity' possibly should have contained a 'Don't know' answer.

The response rates to all but three questions were over 90%, and the lowest of these three was 79.9%.

(v) The Survey Results from the Development Corporation

In 1972, the Department of Architecture, Planning and Quantity Surveying in the Development Corporation published the results of a Household Survey carried out in 1971. A 10% sample of households in the town had been surveyed, and answers to a variety of questions on household structure, house facilities, and activities gained for 88% of the sample households. This information provided demographic and socio-economic information for eight of the nine precincts surveyed. (Pitteuchar was too small at the time of survey to produce useful results).

At about the same time the Department had also carried out surveys of adult leisure activities and children's play facilities on a precinct by precinct basis, thus providing information on eight of the nine precincts.⁵

Updated demographic and socio-economic information was available for 1973 and 1974 on all the precincts in the town, as a result of the annual analyses of incoming and outgoing tenants. Although deficient on information for owner occupiers, these form a relatively small

proportion of the population (10%) and so relatively accurate up to date information for all the precincts was available for such characteristics as social class and age structure.⁶

(vi) The Quarterly Returns from the Social Work Area Office

Glenrothes Area Social Work Office dealt with social problems in the New Town, the Constellation and some areas to the North of Leslie and Markinch. Every three months a return of the workload generated in each subdivision of the area was made out, listing nine categories of case type.⁷ The subdivisions used corresponded to the precincts of Glenrothes and the towns and villages of the Constellation.

The returns for the four quarters up to October 1974 were used in the precinct analysis.

The Reliability of the Data

(i) Data obtained from more than one source

Five characteristics were obtained from the parental questionnaire and from the school records. They are listed below:

(a) Working Mother: 443 responses (65.3%)

There were four inconsistencies. It was assumed that the mother had either stopped or started work recently. In all the four cases, the mother was classified as being a working mother, as this had at a recent time been the case.

(b) Social Class: 662 responses (97.7%)

There were six inconsistencies. A recent change of jobs was assumed. In all six cases the response to the questionnaire was regarded as the correct one, as this was more recent.

(c) Family Size: 653 responses (96.5%)

There were 23 inconsistencies. In 17 of these cases, the school figure was larger, and in 12 of these cases there was an indication that an older child had left home (this was ascertained from the family age structure). Four of the other six cases involved a recent birth. In all cases the larger figure was taken as correct.

(d) Birth Order: 654 responses (96.7%)

There were 17 inconsistencies. These corresponded to the 17 families with inconsistent family sizes. The same reason for the discrepancy was assumed, and in all cases the larger number was taken.

(e) Lack of both Natural Parents: 452 responses (66.4%)

There were two inconsistencies with regard to this characteristic, in both cases, the lack of a natural parent was assumed.

(ii) The Questionnaire

(a) Social Class: There was a slight bias towards those in higher social classes in responses to the questionnaire. A higher proportion of non-manual workers returned the questionnaire than did manual workers.

Table 6.6 The Response Rate on the Questionnaire by Social Class

Social Class	Sample Population		Responses		Response Rate(%)
	No.	%	No.	%	
I	40	5.9	31	7.3	77.5
II	113	16.6	96	22.6	85.0
III Non-Manual	63	9.3	36	8.5	57.1
III Manual	324	47.7	184	43.4	56.8
IV	80	11.8	52	12.3	65.0
V	24	3.5	9	2.1	37.5
Armed Forces	10	1.5	6	1.4	60.0
Unemployed	8	1.2	5	1.2	62.5
Not Stated	17	2.5	5	1.2	29.4
Total	679	100	424	100	62.4

The class differences between the two groups did not reach the 5% level of statistical significance.⁸

(b) Attainment: Children of families returning the questionnaire tended to have higher scores than those who did not.

Table 6.7 Average Scores of Children on the Attainment Tests

Test	Total in Sample (679)	Those answering Questionnaire (424)
Picture Intelligence '69	67.86	68.83
Picture Intelligence '70	67.60	71.96
Reading '69	26.85	27.30

Reading	'70	24.98	26.41
Mathematics	'69	60.06	60.18
Mathematics	'70	47.44	49.81
Verbal Reasoning	'73	104.47	105.25
Verbal Reasoning	'74	100.49	101.15

In all eight tests, the average scores of those answering the questionnaire were higher than the scores of those not answering the questionnaire. However none of the differences were statistically significant at the 5% level using the T-test.

(c) Variation between Areas: The response rate varied between the schools from 42.9% to 100%

Table 6.8 Questionnaires returned from the Schools by School

School	Questionnaires					
	Distributed		Returned		Answered	
	No.	%	No.	%	No.	%
Glenrothes:						
Carleton	68	100	68	100	54	79.4
Warout	101	100	72	71.3	50	49.5
South Parks	89	100	61	68.5	59	66.3
Rimbleton	81	100	54	66.7	47	58.0
Southwood	69	100	52	75.3	44	63.8
Caskieberran	38	100	29	76.3	23	60.5
Taushall	62	100	56	90.3	51	82.3
Pitteuchar	32	100	26	81.3	23	71.9
Total	540	100	418	77.4	351	65.0
The Constellation:						
Coaltown	21	100	21	100	9	42.9
Leslie	57	100	31	54.4	25	43.9
Markinch	41	100	33	80.5	25	61.0
Milton	2	100	2	100	2	100
Thornton	18	100	16	88.9	12	66.7
Total	139	100	103	74.1	73	52.5

There was a higher response rate amongst Glenrothes Schools. There was also a higher response rate in Glenrothes for the lower Social Classes than in the Constellation sample.

Table 6.9 Response Rates by Social Class for Glenrothes and the Constellation

Social Class	Total Sample		Respondents		Response
	No.	%	No.	%	Rate %
<u>Glenrothes</u>					
I	35	6.5	26	7.4	74.3
II	86	15.9	72	20.5	83.7
III Non-Manual	54	10.0	35	10.0	64.8
III Manual	246	45.6	149	42.4	60.6
IV	68	12.6	46	13.1	67.6
V	17	3.1	7	2.0	41.2
Other	17	3.1	11	3.1	64.7
Not Stated	17	3.1	5	1.4	29.4
Total	540	100	351	100	65.0
<u>The Constellation</u>					
I	5	3.6	5	6.8	100
II	27	19.4	24	32.9	88.9
III Non-Manual	9	6.5	1	1.4	11.1
III Manual	78	56.1	35	47.9	44.9
IV	12	8.6	6	8.2	50.0
V	7	5.0	2	2.7	28.6
Other	1	0.7	-	-	-
Not Stated	-	-	-	-	-
Total	139	100	73	100	52.2

The lower response rate from Constellation schools was accompanied by a greater difference in the scores of those who returned the questionnaire from those who did not, amongst Constellation children compared to Glenrothes children, as is shown in Table 6.10.

Table 6.10 The Scores of Children by area and by whether or not they had returned the questionnaire

<u>Test</u>	<u>Glenrothes</u>			<u>Constellation</u>		
	Total Sample	Those returning Questionnaire	Difference	Total Sample	Those returning Questionnaire	Difference
Picture Intelligence '69	69.568	70.032	0.476	61.778	65.045	3.267
Picture Intelligence '70	70.075	73.409	3.334	61.192	68.800	7.608
Reading '69	27.397	27.642	0.245	24.907	26.381	1.474
Reading '70	26.130	27.364	1.234	22.241	24.500	2.259
Mathematics '69	62.035	61.664	-0.371	52.519	54.737	2.218
Mathematics '70	50.324	52.000	1.676	40.429	45.500	5.071
Verbal Reasoning '73	105.125	105.503	0.378	101.909	105.767	3.858
Verbal Reasoning '74	101.472	101.615	0.143	96.659	100.717	4.058

On all eight tests the bias in attainment for those answering the questionnaire was greater for the Constellation children than for those from Glenrothes. The scores of those returning the questionnaire were much closer between the two areas, than the scores of the whole sample.

To some degree the bias in attainment of those returning the questionnaire corresponds to that bias found in the responses of different social classes to the questionnaire, in that higher response rates were noted for the higher social classes thus biasing the sample towards those social groups usually associated with higher than average attainment.⁹ This bias was more pronounced within the Constellation sample than within that from the New Town as is shown in Table 6.9.

Conclusions

There was a high degree of correspondence between different sources, when the same data was available from more than one source, and on this count the data was considered reliable.

Response rates to the questionnaire differed between schools, but there appeared to be no pattern to this.¹⁰ Of the questions included in the questionnaire all were answered by the great majority of respondents, and plausible explanations for the relatively lower response rates on a few questions could be offered without difficulty. There was, however a class bias in those who answered the questionnaire, those in higher social classes having a higher response rate. This phenomenon was more marked in the Constellation than in the New Town. Similarly there was a higher response rate from families of children with higher attainment scores, and this was also more marked in the Constellation.

Such differences were not statistically significant, yet it does appear that those returning the questionnaire from the two areas may be more similar than their parent populations because of their closer average attainment scores, and interpretations based upon analyses of returned questionnaires must bear this in mind.

NOTES

1. See Chapter Five p.105 for a full description of the sample.
2. See Chapter Four p.95 for the origins of tests, Chapter Five for the children tested, and Appendix I for a description of them.
3. Appendix I.1.
4. The full questionnaire is given in Appendix I.2.
5. Pitteuchar was not sufficiently developed at the time of these surveys.
6. Slight inaccuracies will also occur because of changes in occupation, birth and etc. among sitting tenants.
7. Appendix I.6.
8. The Chi Squared test was used.
9. The relationship between Social Class and Education Attainment is noted in Chapter Two.p.128.
10. No significant relationships with regard to location, school size, social composition, age of school or age of headteacher was discerned.

Chapter Seven

Differences in the level of attainment between Glenrothes and the Constellation

The first hypothesis laid out in Chapter Three stated:

"The level of attainment of children in a New Town will be higher than that of a socio-economically comparable population."

The average scores of the samples of children from both Glenrothes and the Constellation, and the probability of this difference occurring by chance as ascertained by T-tests are given below in Table 7.1

Table 7.1. The attainment of children in Glenrothes and the Constellation

Test	Average Glenrothes Score (No)	Average Constellation Score(No)	Difference	Probability
Picture '69	68.7710	60.8571	7.9139	.015
Intelligence	(210)	(60)		
Picture '70	70.2400	59.9259	10.3141	.021
Intelligence	(73)	(29)		
Reading '69	27.2396	24.7143	2.5253	.003
	(212)	(61)		
Reading '70	26.3026	21.9667	4.3359	.004
	(74)	(32)		
Mathe- '69	60.9045	51.7778	9.1267	.010
matics	(215)	(60)		
Mathe- '70	50.3467	39.9310	10.4157	.005
matics	(73)	(31)		
Verbal '69	103.9754	101.4126	2.5628	.054
Reasoning	(540)	(139)		
Verbal '70	100.3109	96.0839	4.2270	.002
Reasoning	(540)	(139)		

On all eight of the tests the Glenrothes children scored higher.

On seven of these tests the difference would have occurred by chance less than five times in one hundred, and so could be considered statistically significant. On the eighth test, this level was very nearly reached. Clearly the level of attainment of the Glenrothes children was higher.

As was noted in the preceding chapters ¹ the social structure of the two areas was similar and the two samples taken reflected this.

Table 7.2 The Social Structure of the sample from the two areas.*

Social Class	Glenrothes		Constellation		Fife +
	No.	%	No.	%	%
I	35	6.9	5	3.6	3.9
II	86	17.0	27	19.6	17.4
III Non-Manual	54	10.7	9	6.5	10.7
III Manual	246	48.6	78	56.5	40.7
IV	68	13.4	12	8.7	18.2
V	17	3.4	7	5.1	9.1
Total	506	100	138	100	100

* Only those with occupations, which were assigned a social class by the Registrar General are included.

+ 1971 Census of Scotland.

Upon controlling for social class ² on the test results, very little change in the differences between the two areas was noted as is shown in table 7.3. On three out of the eight tests, the differences in average scores between areas, in fact, increased. On none of the other five did the difference between areas decrease by more than one fifth of the difference.

When children of manual and of non-manual workers were compared separately, as in table 7.3., in both situations, the New Town children had average scores higher than those from the Constellation on all eight tests, several of them at the .05 level of significance. Those differences not being statistically significant tended to be on small sample sizes.

Table 7.3 Differences in Attainment Scores between Children from Glenrothes and the Constellation, for Manual and White Collar Workers' Children, and controlling for Social Class

Test	Difference between Areas	Difference Controlling for Social Class	Difference for Children of Manual Workers	Difference for Children of non-Manual Workers
Picture '69				
Intelligence	7.91*	6.49*	4.96	7.86*
Picture '70				
Intelligence	10.31*	9.87*	13.23	7.23
Reading '69	2.53*	2.30*	2.24*	3.45*
Reading '70	4.34*	4.10*	5.00*	3.64*
Mathematics '69	9.13*	8.46*	13.41*	8.55*
Mathematics '70	10.42*	10.90*	11.73	9.17*
Verbal				
Reasoning '73	2.56	2.90*	4.25	2.83
Verbal				
Reasoning '74	4.23*	4.26*	3.95	5.16*

* These differences were significant at the .05 level of probability.

All the evidence was consistent in demonstrating the children in Glenrothes have performed better on all eight attainment tests and that this was not a result of social class differences between the two areas. It would therefore appear that Hypothesis One is corroborated and that the level of attainment of children in the New Town was higher than that of a socio-economically comparable population.

This was reinforced by a comparison of Glenrothes pupils with those in the whole county on the three attainment tests administered to seven year olds.

In March 1972, the three attainment tests for seven year olds were administered to all children in the county for the last time. The results of these tests indicated above average scores for children in Glenrothes'

schools as shown in table 7.4

Table 7.4 Average Scores on the Attainment Tests for Seven Year
Olds in Glenrothes and Fife

	<u>Glenrothes</u>		<u>Fife</u>	
	Score	No. of Pupils	Score	No. of Pupils
Picture Intelligence	102.3*	296	100*	2,630
Reading	30.8	298	27.7	2,633
Mathematics	63.1	302	60.0	2,614

* The quotients only for this test were available from the records at the Education Department.

The Associated Indicators of Educational Attainment

In Chapter Two, it was noted that there were a large number of indicators of educational attainment, and also that some of these indicators have well established causal links with attainment. They can be regarded as determinants of educational attainment. The corroboration of the First Hypothesis raised the question as to which ways Glenrothes children differed from those of the Constellation, such that the differences in attainment might be accounted for by differences in established determinants of educational attainment between the areas. Of the eight major indicators of educational attainment noted in Chapter Two,³ no significant differences in school or neighbourhood characteristics were noted,⁴ thus indicating that the differences in attainment between the two samples might be accounted for by differences in home backgrounds between Glenrothes and the Constellation. An analysis of the differences between the two samples on these characteristics was therefore conducted.

Each of the characteristics was first investigated to detect any relationship with attainment,⁵ and those which evidenced significant relationships to educational attainment were then investigated as to

possible differences on them between Glenrothes and the Constellation.⁶
This was done in order to determine which group was advantaged with regard to that characteristic and the results are shown in table 7.5 (E.g. Library membership was significantly associated with attainment, and a significantly higher proportion of parents in Glenrothes were members of a library, therefore the Glenrothes children were advantaged with regard to parental library membership. The level of probability shown refers to the likelihood of that difference in parents' being members of a library occurring by chance.)

Table 7.5 Differences between Areas on Indicators Significantly Associated with Educational Attainment

<u>Advantage to Glenrothes</u>	<u>Probability</u>	<u>Advantage to the Constellation</u>	<u>Probability</u>
<u>1. Home Circumstances</u>			
1.Number of rooms	.031	1.Type of house	.001
2.Persons per room	(.767)	2.Tenure of house	.0001
3.Telephone	.038	3.Central Heating	(.754)
4.Age of Dwelling	.001	4.Playspace	(.632)
<u>2. Parental Attitudes and Behaviour*</u>			
1.Library member(husband)	.001		
2.Library member(Wife)	.001		
3.Frequency of visits to library(husband)	.003		
4.Frequency of School visiting(husband)	.001		
5.Frequency of School visiting(Wife)	.001		
6.Uninvited visit to the School(husband)	(.614)		
7.Help with Schoolwork (husband)	.050		
8.Frequency of family outings	(.432)		

3. Family Characteristics

- | | | | |
|----------------|--------|-------------------------------------|--------|
| 1. Family size | (.636) | 1. Lack of both
Natural Parents. | (.958) |
|----------------|--------|-------------------------------------|--------|

4. Indicators which may be as much an effect of attainment as a cause

1. Frequency of child's
reading at home (.236)
2. Expected school
leaving age. .001
3. Satisfaction with
child's progress (.684)

- * This refers to both parental aspiration and encouragement and parental education and literacy.
- () Those probabilities in brackets were not regarded as indicating significant differences.

The children in the New Town did not appear to gain any great material advantages from their home circumstances. The Glenrothes' houses had more rooms, but when the number of residents was taken into account, this advantage lost its significance. The houses in Glenrothes were also newer and hence more likely to have central heating, which may have made working at home easier in the Winter,⁷ but they were much less likely to be owned by the occupier or to have been detached or semi-detached, two characteristics strongly associated with children's attainment.

Similarly family characteristics favoured neither area with respect to educational attainment.

However, indicators of family attitudes and behaviour wholly favoured the New Town children. On none of the eight characteristics associated with attainment did the children of the Constellation benefit. The six indicators of attainment which demonstrated significant differences between the two areas centred on parental literacy and involvement with the child's education. Library

membership was much higher in the New Town, as was the frequency of library visiting for the father. Visits to the school and help with homework were also significantly different between the two areas. The Plowden Report attached great importance to the two areas of parental literacy and involvement with the child's education.⁸ Upon the basis of its conclusions and the results of the surveys upon which they were based, a significant educational advantage should accrue to children with parents of this inclination and in this instance to children of parents living in Glenrothes.⁹ Of the seven variables indicating parental attitudes associated with attainment five involve the husband and two the wife, a situation in line with the importance attached by Wiseman to paternal involvement for children of higher than average attainment.¹⁰

The three indicators which may be as much an effect of attainment as a cause, all indicate an advantage to the Glenrothes' children, and this adds weight to the significance of the advantage in educational attainment of the New Town children compared to those of the Constellation.

Conclusion

Hypothesis One has been corroborated. The sample derived from the Constellation was similar in socio-economic terms to that of the New Town, and the children from Glenrothes performed significantly better on the attainment tests than the children from the Constellation. This advantage was not related to material advantages of the home but to considerable differences in parental attitudes and behaviour especially with regard to involvement with the children's education and literacy, thus indicating that differences in attitudes and activities between the New Town and the Constellation may largely

account for the differences in the educational attainments of children from the two areas.

NOTES

1. pp.101-102, and p.125 table 6.9.
2. The method for so doing is given in Appendix V.
3. pp. 44 to 53.
4. See Chapter Eleven pp.200-201.
5. The relationship to educational attainment of each variable investigated is setout in Appendix II.
6. Differences in the relationships of each variable to educational attainment between the two areas are set out in Appendix III.
7. Dale and Griffith, op.cit., noted that of their sample of 39 Grammer School pupils, whose performance deteriorated markedly through their progress up the school, half went home to a house with only one warm room.
8. Op.cit. Vol. I. pp 34 to 36 paras. 92 to 101.
9. Other evidence supports Plowden on this point, see Chapter Two pp. 44 - 49.
10. Op.cit. 1967, Vol.II, Appendix 9 p. 382 para. 110 and p.377 para.94.

Chapter Eight

Social Stratification

The Second Hypothesis laid out in Chapter Three stated:

"Differences in the level of educational attainment between social classes will be smaller in the New Town than in a comparable population."

There are many ways of defining 'class' or 'social class' and several different ones have been used in investigations of educational attainment and in studies of New Towns.¹ The Registrar General's classification is the most commonly used, and was used as a measure of social class in this study.

The Registrar General's classification of occupations² lists five social classes, the third of which, that containing skilled workers, is frequently divided into manual and non-manual categories. The resulting classification of occupation is.

- I. Professional etc. occupations.
- II. Intermediate occupations.
- III. N. skilled occupations: Non-Manual.
- III. M. skilled occupations: Manual.
- IV. Partly skilled occupations.
- V. Unskilled occupations.

However there are many other valid ways of stratifying a community, some of which were also investigated.

Differences in attainment between the classes

There was a notable gradation of attainment through the social classes in both areas, with the average level of attainment rising from children in Social Class V to those in Social Class I. However there were notable differences between the two areas.

Table 8.1. Average differences in attainment test scores between Social Classes IV and V and Social Class I

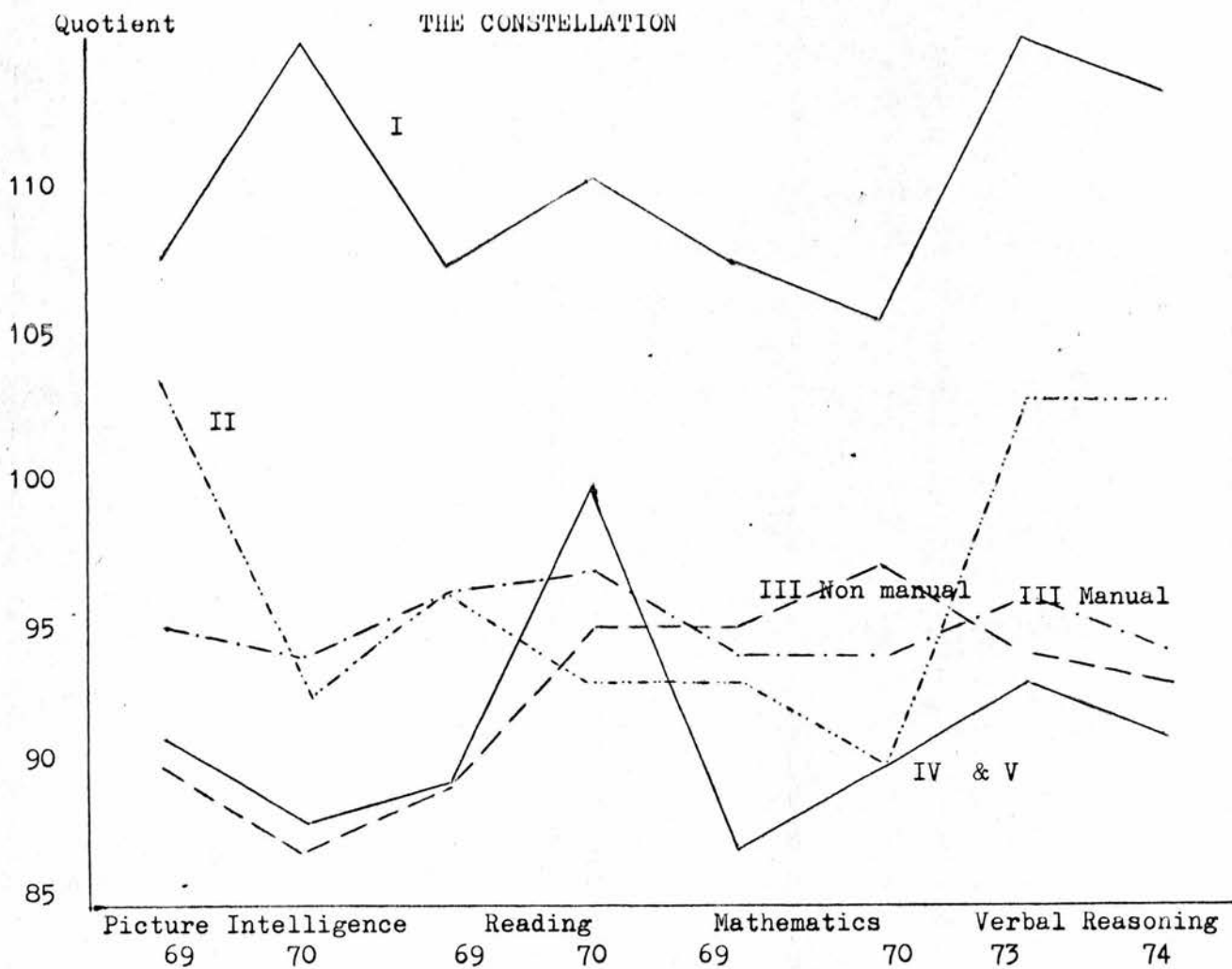
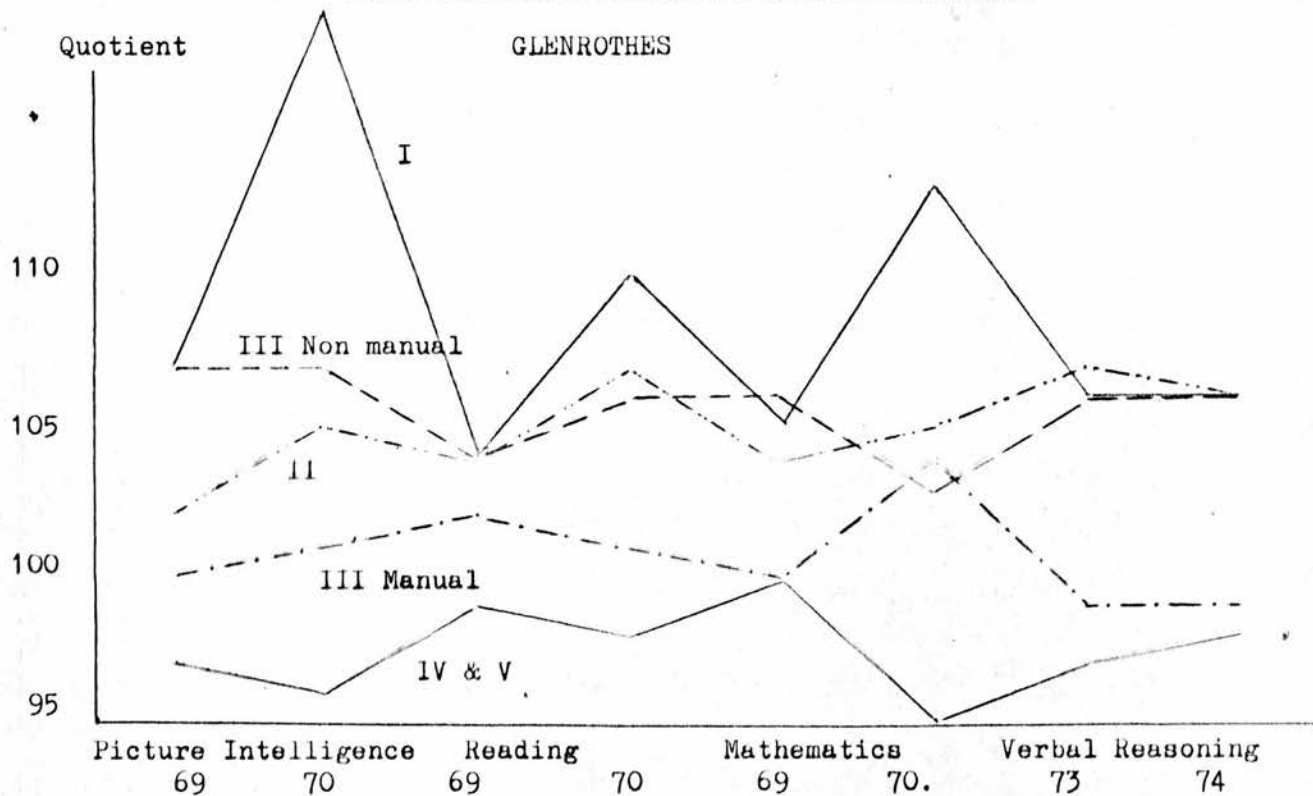
<u>Test</u>		<u>Glenrothes</u> <u>Difference</u>	<u>Constellation</u> <u>Difference</u>	<u>Ratio of the</u> <u>two differences</u>
Picture Intelligence	'69	7.99	24.00	3.00
Picture Intelligence	'70	24.33	32.00	1.32
Reading	'69	- 0.29	8.33	.00
Reading	'70*	4.78	4.50	0.94
Mathematics	'69	5.38	29.67	5.52
Mathematics	'70*	16.33	17.33	1.06
Verbal Reasoning	'73	11.56	23.00	1.99
Verbal Reasoning	'74	7.34	23.17	3.16

* In these tests, the differences shown are between classes I and IV. On all the other tests, the differences shown are between classes I and V. On the two tests marked with * the number of children from social class five was insufficient for an adequate comparison to be made. (On all the test except those of verbal reasoning, sample sizes were very small.)

On only one of the eight tests was the difference in scores between classes more in the New Town, than in the Constellation, and that was by the small margin of 0.277 points on reading score in 1970 (cf margin of over eight points in the other direction for a larger sample in 1969). The average difference between the mean scores of social classes I and V in the New Town was less than half that in the Constellation on the tests of verbal reasoning.

Table 8.2 indicated attainment profiles for all the social classes in the two areas. In only two cases out of 32 was the difference between the average score of any social class and that of social class one greater among the New Town children than among children in the surrounding Constellation.

Table 8.2. Attainment Profile by Test by Social Class



All these indications pointed to there being smaller differences in educational attainment amongst the New Town children. The significance of these indications was investigated in three ways; analysis of variance, T-tests, and multiple regression.³

1. Analysis of Variance

Analysis of Variance enables the total variation in a set of data to be reduced to components associated with possible sources of variability, whose relative importance can be assessed. Analysis of variance was used in this situation to determine the importance of social class as a source of variability in both the Constellation and the New Town, and to compare its importance in the two areas. The importance of social class as a source of variability in each sample was determined by the proportion of total variance accounted for between social classes compared to that variance within social classes. The more variance accounted for between social classes, the greater the importance of social class as a source of variability. On all but one test (and that had the smallest sample size) the proportion of variance between social classes in Glenrothes was less than that proportion between social classes in the Constellation. On an average of all eight tests, the proportion of the total variance between social classes in the New Town sample was about half that in the Constellation sample.

Snedecor's F-test can be used to determine whether or not the dispersions of one variable for two samples differ significantly, i.e. whether the dispersion for one sample is significantly greater than the other. This entails a comparison of the variances of the two samples. The test was used to determine whether or not there was a significantly narrower dispersion of educational attainment in the

New Town, and also whether the dispersion of attainment between social classes was significantly narrower in the New Town, than in the Constellation. This procedure was repeated when the Glenrothes' sample was reduced to the same size as that of the Constellation by random sampling.

Table 8.3.

Variance Between Social Classes

<u>Test</u>	No.	<u>Glenrothes</u>		No.	<u>Constellation</u>		F Score	Level of significance
		Variance between classes	% of total variance		Variance between classes	% of total variance		
Picture Intelligence '69	192	49	14.8	54	10.1	22.8	2.05	.01
Picture Intelligence '70	67	1.25	48.0	26	14.7	38.0	1.18*	NS
Reading '69	194	0.59	4.6	54	8.0	27.5	13.6	.001
Reading '70	69	4.2	12.3	29	17.9	41.5	4.27	.001
Mathematics '69	198	16.9	4.9	52	10.8	20.0	6.4	.001
Mathematics '70	68	50.3	20.8	28	62.5	23.5	1.25	N.S.
Verbal Reasoning. '73	514	41.0	20.0	152	90.0	44.0	2.18	.01
Verbal Reasoning. '74	513	20.8	10.3	132	88.0	43.7	4.25	.001

With Equalised Sample Sizes:

Test	<u>Glenrothes</u>					<u>Constellation</u>				
	No.	Total	Vari- ance with- in class- es.	Bet- ween class- es		No.	Total	Vari- ance with- in class- es	Bet- ween class- es	Level of signif- icance
Picture Intelli- gence	'69	42	269	265	4	53	441	301	140	.001
Picture Intelli- gence	'70	29	268	207	61	26	383	339	44	NS*
Reading	'69	42	4.92	3.86	1.08	53	29.0	22	6.3	.001
Reading	'70	29	33.7	30.1	3.6	29	47.4	41.2	6.2	NS
Mathe- matics	'69	43	248	207	41	51	544	396	150	.001
Mathe- matics	'70	29	248	205	43	28	267	260	7	.01 *
Verbal Reason- ing	'73	134	191	161	30	131	203	74	129	.001
Verbal Reason- ing	'74	134	174	139	35	131	201	67	134	.001

Only level of significance above .05 are noted.

* In these cases, variance between classes in the Constellation was less.

Whilst the total variance of the Constellation sample was greater than that of the New Town sample, on all eight tests on only one test did this reach the .05 level of statistical significance (Reading Ability, 1969). However the variance between social classes in the Constellation sample was much larger than that of the New Town group, both in absolute terms and as a proportion of the total variance in attainment in each area. On five out of the eight tests this was statistically significant at the .01 level.

The results of the analysis of variance indicate that the distribution of attainment within Glenrothes is smaller than that in the Constellation (the attainment profiles indicated this, needing a wider range of scores to express the profile for the Constellation) and that social class plays a much less important part in determining this variation in attainment. The variance accounted for by social class in the New Town was about half that accounted for in the Constellation.

2. T-tests

This mode of analysis was used to determine, whether or not average differences in attainment scores between different social classes were significantly less in the New Town than in the Constellation. As the numbers in each social class were too small to enable reliable results to be obtained from comparisons among them, they were grouped to provide large enough numbers for comparisons to be made. Three groupings were used:

- (i) Social Classes I and II and Social Classes III, IV and V.
- (ii) Manual (Social Classes III Manual, IV and I) and Non-Manual (Social Classes I, II and III Non-Manual)
- (iii) Social Classes I and II and Social Classes IV and V.

Table 8.4 shows the results obtained. No significant differences between the areas were found when children of manual and of non-manual workers were compared; on three of the tests, differences amongst New Town children were smaller but on the other five the opposite occurred.

However, when children from families where the head of the household was an unskilled or a semi-skilled worker, were compared with the other groups or with those from the top two social classes, significantly smaller differences were noted in the New Town sample. Of the ten comparisons made, nine showed smaller class differences in attainment in the New Town, and four of these were significant at the .05 level of probability. These results tend to confirm the hypothesis, but the discrepancy of the results from the division between manual and white collar workers called for further investigation.

Table 8.4

Differences in attainment between Social Classes in the two areas

Test	Score differences between social classes I, II and III non-manual and social classes III manual, IV and V		Score differences between social classes I and II and social classes III, IV and V.		Score differences between social classes I & II and social classes IV and V	
	Glenrothes Constellation	Difference of the Diff-(1) eren-No. ces.	Glenrothes Constellation	Difference of the Diff-(1) eren-No. ces.	Glenrothes Constellation	Difference of the Diff-(1) eren-No. ces.
Picture Intelligence '69	8.896	11.7977	5.759	13.684	(2) 7.925	9 16.889
Picture Intelligence '70	9.390	3.444				
Reading '69	0.765	1.072	0.665	1.409	0.744	9 2.125
Reading '70	2.289	0.939				
Mathematics '69	6.813	1.866	4.716	1.753	5.637	10.730
Mathematics '70	5.041	2.430			-2.423	9 5.057
Verbal Reasoning '73	8.755	7.376	7.068	10.180	(2) 3.112	32 12.006
Verbal Reasoning '74	7.422	8.625	5.648	11.645	(2) 5.997	32 13.655
			1.202	41		32 6.219

(1) No. refers to the number in the smallest category. In all cases this is in the Constellation group, in the three tables, it is in Social Classes I, II and III, I and II and IV and V respectively.

(2) These differences were significant at the .05 level of probability.

Differences in attainment between the children of Manual and Non-Manual workers

The division between manual and white-collar workers divides social class III into two groups; manual and non-manual. The greatest difference in attainment between the two areas existed for children from social class III non-manual. The attainment profiles in figures 8.2 and 8.5 demonstrate this, whereas the difference in attainment between the two areas for children from social class III manual was in line with the average difference between the areas.

Table 8.4. Differences in quotient between the areas for children of Social Classes III Manual and III Non-Manual

<u>Social Class</u>	Picture Intelligence.		Reading		Mathematics		Verbal Reasoning		Average
	'69	'70	'69	'70	'69	'70	'63	'74	
III Non-Manual	17	20	15	11	11	6	13	14	13.4
III Manual	5	7	6	4	6	10	3	5	5.7
Average for all classes	5	12	7	10	6	9	3	4	7.1

The advantages in attainment scores of children in Glenrothes from social class III non-manual background over their Constellation equivalents were over twice as great as those of their counterparts from class III manual backgrounds, and were almost twice as great as the averages for the entire population.

In Glenrothes, this group of children had average scores as high or higher than children from social class I on five out of the eight tests, and on only one test did they score lower than any group of manual workers' children. Their equivalents in the Constellation, however, had average scores lower than children from classes IV and V on four out of the eight tests, and on only two did they score higher than every manual workers' group. (Table 8.2)

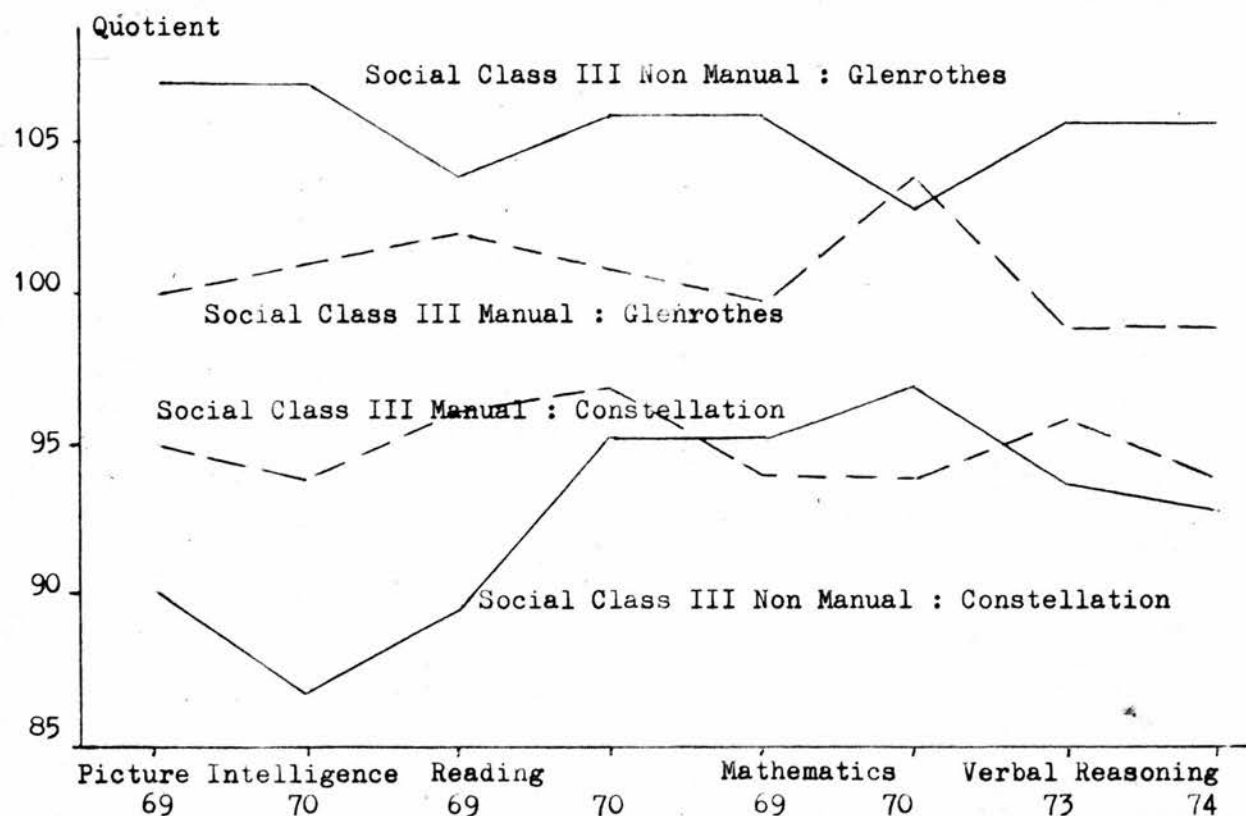
When both the samples from the two areas were combined a simple gradation of attainment was noted, for each test running from social class five to social class one. A finding which was in line with established research data.⁴ However when considered separately, children of social class III non-manual are much above average in the New Town where they have scores as high as social class II and much below average in the Constellation, where their scores tend to fall between those of social class III manual and social classes IV and V.

These large differences explain why there is no difference between the two areas in the attainment scores of children from manual and non-manual backgrounds, when they exist for social class I and II and IV and V. The low scores of the children from class III non-manual keep the scores of the children from white collar backgrounds down in the Constellation, and hence minimise the class difference, and the high scores of the equivalent group of children in the New Town keep the scores of the white collar group up, and hence maximise the difference between classes.

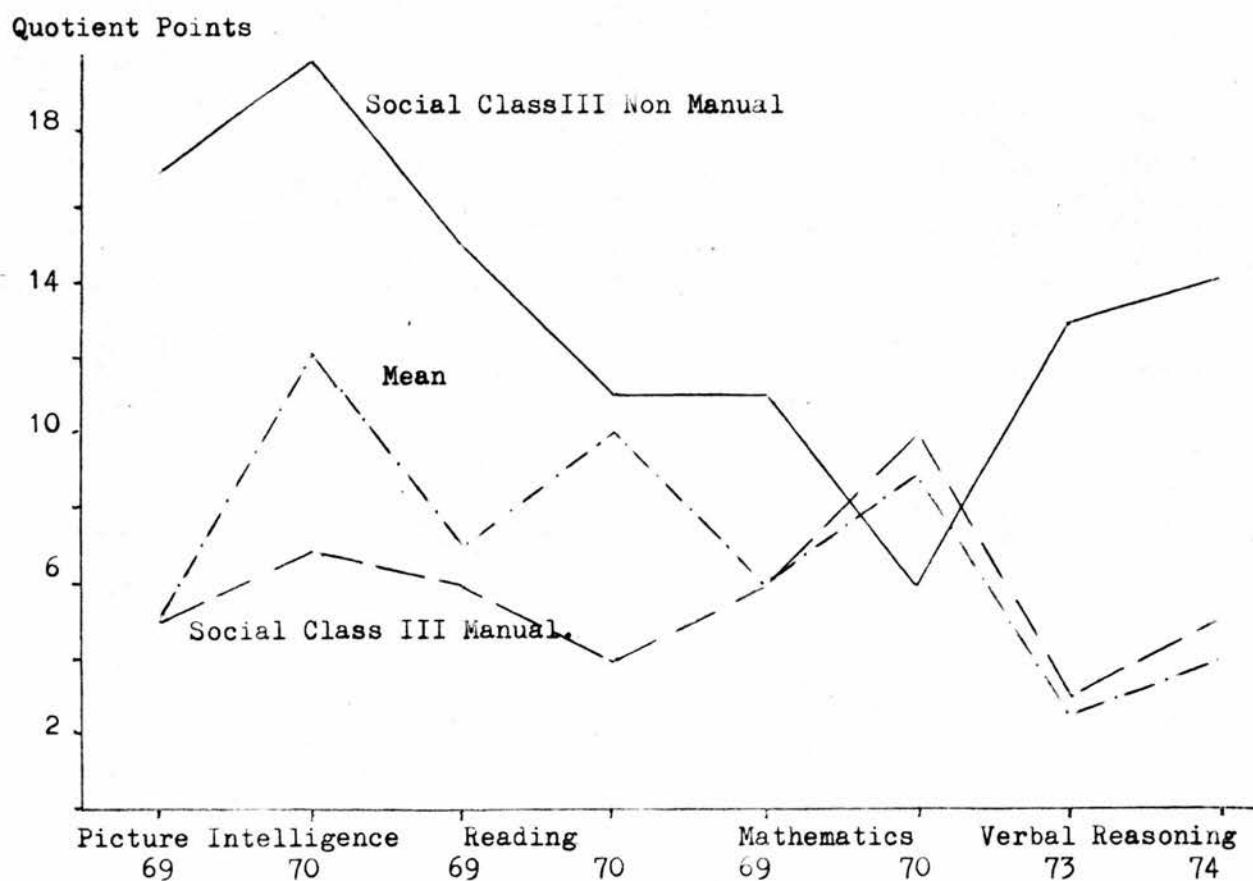
The reasons for this phenomenon may be due to sampling errors, or they may relate to some peculiarity of the respective areas' social development. For clarification this phenomenon is worthy of further investigation.

Table 8.5. Attainment Profiles of Social Classes III Manual and III Non-manual

(i). Attainment Profiles for each Area of Social Classes III Manual and III Non-manual



(ii). Differences in Attainment Quotient between Glenrothes and the Constellation for Social Classes III Manual and III Non-manual and the Mean Differences



3. Multiple Regression Analysis

Four variables concerned with socio-economic background were investigated; father's workstatus, mother's workstatus, social class and mother's occupation. Together the four gave a more reliable picture of socio-economic circumstances than the one variable of social class. This was done using stepwise multiple regression analysis, in which a regression coefficient is produced which represents the degree of association of the dependent variable (e.g. attainment) with the sum of several independent variables. In this procedure the first regression coefficient produced is equivalent to a simple correlation coefficient between a dependent and an independent variable, the second is the result of adding to the first coefficient any further association between the dependent variable and a second independent variable not accounted for in the first regression coefficient. This procedure can then be continued to three, four and more independent variables. Whilst no other evidence has shown any relationship between mother's workstatus and her children's attainment,⁵ strong links have been demonstrated between paternal unemployment and poor attainment;⁶ an association which was confirmed in this investigation.⁷

Table 3.6 Multiple Regression Coefficients between attainment and socio-economic variables for the two areas

<u>Test</u>	<u>Glenrothes</u>		<u>Constellation</u>	
	Coefficient	No.	Coefficient	No.
Picture Intelligence '69	.352	192	.703	54
Picture Intelligence '70	.548	67	.358	26
Reading '69	.143	194	.622	54
Reading '70	.426	69	.312	29

Mathematics	'69	.269	198	.403	.52
Mathematics	'70	.281	68	.312	.28
Verbal Reasoning	'73	.362	514	.424	132
Verbal Reasoning	'74	.329	513	.491	132

On six out of the eight tests the coefficients was larger for the Glenrothes sample, and the two tests on which this was not the case, were those with the smallest sample sizes. On average, the socio-economic variables accounted for twice the variance in attainment in the Constellation than they did in Glenrothes, thus providing further evidence with which to confirm the hypothesis.⁸

4. Conclusions upon the relationship of Social Class and Educational Attainment in the two areas

All three modes of analysis lent support to the hypothesis. Variance between classes, differences in average scores and coefficients with socio-economic characteristics were all less in Glenrothes than the Constellation. The differences in the variance between classes in the two areas were of the same order in both the regression analysis and the analysis of variance, i.e. the variance in attainment accounted for by social class or socio-economic characteristics in the New Town was about half that so accounted in the Constellation. Quotient differences between the extreme social classes (i.e. I and V) were also about half in the New Town of the Constellation differences. The evidence is remarkably consistent and the corroboration of Hypothesis Two follows from it. However there was no indication that average differences between manual workers' children and those of non-manual workers were less in the New Town than in the Constellation. The importance of the manual:white collar division in society is of considerable sociological significance and the salience of this division has been noted in numerous studies.⁹ The corroboration of

the hypothesis is denied much of its emphasis by this phenomenon.

Social Stratification in the New Town and in the Constellation

As was pointed out at the beginning of this Chapter, social class as defined by the Registrar General is but one way of stratifying a community along socio-economic lines. There are many other indices of social stratification, one of which was used in the multiple regression analysis, where workstatus and both parents' occupations were also used.

Other dimensions of stratification include home and material circumstances. Home ownership is a significant division in any community.¹⁰ The possession or otherwise of home amenities such as central heating, a telephone and a garage represents a division between the more and less affluent members of this society. Such divisions are very much related to income and hence to occupation. Other dimensions of stratification have much more tenuous links to income. These include cultural homes, such as family relationships, social activities, aspirations and attitudes towards social institutions, such as schools, religious and political organisations.¹¹

These other dimensions of stratification are not completely independent of the economic ones. Douglas Holly has written of 'a coherent and pervasive system of values attaching to a given social position,'¹² and Richard Hoggart¹³ and Brian Jackson¹⁴ have given accounts of the non-work activities of working class people, implicitly, if not explicitly noting the differences from those of the middle class. Within these broad classes there are also considerable differences, often based on attitudes rather than an economic relationship, the old division of the working class into 'respectable' and

'rough' elements is a case in point.¹⁵ However such divisions are not entirely independent of occupational differences, 'respectable' working class homes contained a high proportion of skilled workers than did 'rough' ones.

It has been argued that the interrelationship of socio-economic and cultural variables was such that an attempt to change just one of them, as proposed by Plowden, was doomed to failure, or at best, inauspicious success.¹⁶ Undoubtedly the greater the reinforcement of one social division by another with a similar cleavage, makes the first more difficult to change, and the correspondence of several social divisions indicates a rigidly stratified society.

Several variables used in the questionnaire represented conditions with which children's high attainment was associated (e.g. home ownership as opposed to tenancy and frequent as opposed to infrequent parental visits to the library). 18 such variables were significantly associated with educational attainment (by Chi-Squared, T-test or correlation) and for each of the variables most and least advantaged (with respect to educational attainment) conditions existed. For example children of residents of detached dwellings had average scores higher than children of residents of other house types, and children living in flats or tenements had average scores lower than children living in other types of dwelling. The differences in attainment between children living in these types of house was statistically significant (by T-test). Those children living in detached dwellings were therefore the most advantaged, and those living in flats or tenements the least advantaged with regard to educational attainment.

The other 17 variables evidenced similar differences, e.g.s.library

visits by the husband every week indicated advantage, and no visits at all indicated disadvantage; satisfaction with child's progress indicated advantage, and dissatisfaction disadvantage; husband's Trade Union membership advantage, and non-membership disadvantage, and presence of both natural parents and advantage and absence of either a disadvantage.¹⁷

Table 8.7 sets out differences in verbal reasoning quotients between most and least advantaged groups of these criteria. In 15 out of the 18 situations the difference between most and least favoured was less in the New Town. Of the three which indicated a greater difference in the New Town, two were to some degree consequences of attainment; frequency of child's reading at home and satisfaction with child's progress. As in the case of social class variation, differences in the New Town were about half those in the Constellation. Of particular note was the situation where there was a lack of one natural parent. In both areas this was associated with a large deficit in attainment, but in the Constellation this was as high as 15 points or one standard deviation, in comparison to half this in the New Town.¹⁸

Attainment was less strongly associated with other family characteristics in the New Town. The average correlation coefficients of attainment with both family size and birth order of the New Town sample were less than half that of the Constellation group.

Multiple regression analysis was used to indicate the relationship of attainment to composite variables on home circumstances, parental education, parental attitudes and behaviour and family structure by combining the individual variables in these categories by stepwise regression. Of 29 regression coefficients calculated between these four composite variables and the eight attainment test 28 indicated a

Table 8.7

Differences in verbal reasoning quotient between most and
least advantaged groups on various indicators

<u>Variable</u>	<u>Difference between advantaged and disadvantaged groups in quotient points</u>		
	<u>Glenrothes</u>	<u>Constellation</u>	<u>Difference</u>
House type	10.2	11.5	1.3
Tenure	6.0	11.0	5.0
Central Heating	4.0	10.0	6.0
Telephone	2.0	11.0	9.0
Age of Dwelling	6.5	11.0	4.5
Library visits - Husband	9.0	17.0	8.0
Library visits - Wife	6.0	13.0	7.0
Frequency of child's reading	19.0	17.0	- 2.0
Expected school leaving age.	15.0	24.0	9.0
No. of visits to school-wife	11.0	25.0	14.0
Uninvited visit to school- wife.	4.8	3.0	- 1.8
Frequency of family outings	10.0	11.0	1.0
Satisfaction with child's progress.	8.0	5.0	- 3.0
Membership of organisations- wife.	3.0	10.0	7.0
Trade Unionist - husband,	4.0	9.0	4.0
Trade Unionist - wife.	1.3	9.0	7.7
Contact with neighbours.	2.0	6.5	4.5
Lack of one natural parent.	7.5	15.5	8.0

Table 8.8.

Multiple Regression Coefficients between Attainment
Variables and Composite Data on Home Circumstances,
Parental Education, Parental Attitudes and Family Structure

<u>Test</u>	<u>Regression Coefficients</u> <u>between attainment and</u> <u>home circumstances</u>				<u>Regression Coefficients</u> <u>'between attainment and</u> <u>parental education</u>	
	Glenrothes (No)	Constellation (No)	Glenrothes (No)	Constellation (No)	Glenrothes	Constellation
Picture Intelligence '69	.339 (128)	.437 (37)	.332		.568	
Picture Intelligence '70	.617 (45)	.780 (19)	.371		.412	
Reading '69	.295 (125)	.684 (37)	.212		.333	
Reading '70	.560 (45)	.870 (19)	.348		.726	
Mathematics '69	.391 (130)	.661 (38)	.218		.450	
Mathematics '70	.561 (44)	.669 (20)	.447		.341	
Verbal Reasoning '73	.333 (351)	.556 (73)	.344		.556	
Verbal Reasoning '74	.346 (351)	.566 (73)	.346		.573	
	<u>Regression Coefficients</u> <u>between attainment and</u> <u>parental attitudes and</u> <u>behaviour</u>				<u>Regression Coefficients</u> <u>between attainment and</u> <u>Family Structure</u>	
Picture Intelligence '69	.370	.798	-		-	
Picture Intelligence '70	.459	1.00	.361		.734	
Reading '69	.145	.418	-		-	
Reading '70	.518	.774	.342		.658	
Mathematics '69	.337	.463	-		-	
Mathematics '70	.317	.891	.278		.681	
Verbal Reasoning '73	.347	.533	.242		.485	
Verbal Reasoning '74	.342	.512	.216		.504	

The composite variables were created by stepwise regression analysis and their constituents are set out in a note at the end of the Chapter.¹⁹

less strong relationship in the New Town sample. According to the multiple regression analysis each of these composite variables accounted for about half the variance in attainment in the New Town compared to the Constellation group. Table 8.8 compares the two areas on these composite variables.

Not only was educational attainment in the New Town less stratified by social class compared to the Constellation, but it was also much less stratified in other ways. Home circumstances, parental education and attitudes all accounted for less of the variance in Glenrothes. Attainment in the New Town was less rigidly stratified than in the Constellation.

A multiple regression analysis also revealed a weaker association in the New Town between the composite variables and social class itself.

Table 8.9. Multiple Regression Coefficients between Social Class and Composite Variables¹⁹ on Home Circumstances, Parental Attitudes and Behaviour and Family Structure

<u>Characteristic</u>	<u>Regression Coefficient with Social Class</u>			
	<u>Glenrothes</u>	<u>No.</u>	<u>Constellation</u>	<u>No.</u>
Home Circumstances	.533	333	.625	67.
Parental Education	.606		.487	
Parental Attitudes	.314		.399	
Family Structure	.199		.304	

In three out of the four cases, the coefficient for the New Town sample was smaller, but only one 'Family Structure' indicated that it accounted for as little as half the variance in the New Town as the Constellation, a situation associated with the .05 level of probability.

However, of 24 indicators of parental attitudes and family characteristics, 21 indicated a smaller variance between classes in the New Town. Similarly a correlation analysis of the nine such indicators which were significantly correlated with social class

revealed eight to have lower correlation coefficients amongst the Glenrothes sample.²⁰ It was therefore concluded that there was less correspondence between social class and these attributes in the New Town than in the Constellation.

A comparison was made between houses with all the home amenities, including telephone and central heating, and those without, on 32 relevant variables, which indicated attainment, school attendance, parental education, reading habits, involvement with their children, social class, general family activities (such as family outings and visits to relatives) and family structure.²¹ On 28 of the variables the differences between the two groups was less for the New Town sample. This meant that for New Town parents in these two groups, there was less of a difference attainment, their library visits, their visits to the school, their education, the frequency with which they saw their relatives, their membership of trade unions, the contacts with their neighbours, and their family size. Yet there was no indication that the distribution of activities, attitudes and possessions was markedly less wide in the New Town. On each characteristic there was little difference in the distribution in each area.²²

Conclusion

On each of the variables investigated, similar distributions were found in both areas. This applied to socio-economic characteristics, to home characteristics and to family characteristics. Parental attitudes and behaviour differed between the areas, not so much in their distribution, as in their means. Educational attainment was slightly less widely distributed in the New Town, but by no means significantly so, yet the variance between the social classes was

markedly less, as were the differences in attainment between them, in Glenrothes.

The same phenomenon applied to all the indicators of attainment, home circumstances, parental attitudes, parental involvement, and family structure. In the New Town, each was a less reliable indicator of attainment than in the Constellation. This was largely because, whereas in the Constellation the lines of stratification strongly reinforced one another, this was less so in the New Town. In the Constellation, for example, high social class was strongly linked to home ownership, which was strongly linked to the possession of modern amenities, and both were linked strongly to parental attitudes and behaviour and hence their children's attainment. In the New Town, all these linkages were less strong, tenancy and working class occupations were less strongly linked, as were parental attitudes to them, and therefore the children's attainment at school. From the evidence on educational attainment, it would appear that the New Town was a less rigidly stratified community.

Notes

1. See for example Douglas (op.cit. pp.73-74), Willmott (op.cit. pp.96-108) and Schaffer (op.cit. p.186)
2. Registrar General: 'Classification of Occupations,' HMSO.1970
3. See Appendix V for a fuller description of these and other tests used.
4. See Chapter Two pp.48-49, and especially tables 75 and 76 of the 'First Report of the National Child Development Study' in volume II of 'Children and their Primary Schools'.
5. Appendix II p . Fraser (op.cit.pp.65-70) and the National Survey (op.cit.p.77) also noted no relationship.
6. E.g. Douglas (op.cit. p.70)
7. Appendix II p.
8. The variance accounted for by the regression coefficient can be obtained by squaring the coefficient, e.g. on Picture Intelligence '69, socio-economic variables accounted for 12.3% of the variance in scores in the New Town, whereas some 49% was accounted for in the Constellation.
9. See, for example Klein, J. 'Samples from English Cultures', Routledge and Kegan Paul 1961. Swift (op.cit) noted different chances of success at 11+ for non-manual workers (6 in 10) and manual workers (1 in 10).
10. Housing Classes were used by John Rex in a study of Sparkbrook in the 1960s (Op.cit. 1967 and 1968)
11. Numerous works demonstrate these lines of stratification, including those of Josephine Klein, R.E. Paul, Gordon Rose and John Raynor (op.cit.)
12. D.Holly 'Society Schools and Humanity' Paladin 1972.
13. Richard Hoggart, 'The uses of Literacy' Chatto and Windus 1957.
14. Brian Jackson, 'Working Class Community' Routledge and Kegan Paul 1968.
15. J.B. Mays, 'Education and the Unborn Child,' Liverpool University Press, 1962.

16. See Chapter Two. pp.55-57. especially Little, Acland and Bernstein's criticisms.

17. The most favourable conditions and least favourable conditions on the eighteen variables are:

<u>Variable</u>	<u>Most favourable conditions</u>	<u>Least favourable conditions</u>
House type	Detached	Flat or tenement
Tenure	Owner Occupation	Tenancy
Central Heating	Possession	Lack
Telephone	Possession	Lack
Age of Dwelling	Built since 1960	Built before 1960
Library visits by husband.	Every week	Not a member
Library visits by wife.	Every week	Not a member
Frequency of child's reading	Usually every-day.	Not at all.
Expected school leaving age.	18 years.	16 years.
No. of visits to school wife	Between one and six.	None or more than six
Uninvited visit to school - wife.	Not made	Visited
Frequency of family outings.	Last outing less than three weeks ago.	Last outing before Easter.
Satisfaction with child's progress.	Satisfied	Dissatisfied.
Membership of organisations - wife.	Member	Non-member.
Trade Unionist - husband.	Member	Non-member.
Trade Unionist - wife.	Member	Non-member.
Contact with neighbours.	Visited in their homes.	Not visited.
Lack of one natural parent.	Possession of both natural parents.	Lack of one natural parent.

18. The lack of a natural parent is commonly associated with low attainment. See Chapter Two pp.47-48.

19. The composite variables were made up as follows:

Home circumstances: dwelling type, tenure, No. of rooms, No. of residents, No. of amenities, central heating, telephone, playspace, age of dwelling.

Parental Education: school leaving age, level of education and No. of courses attended, for both parents.

Parental Attitudes and Behaviour: Library visits, and No. of organisations joined; for both parents, frequency of contact with relatives, contact with neighbours.

Family Structure: disabled husband, disabled wife, family size, birth order, lack of one natural parent.

20. Appendix IV.

21. Appendix IV.

22. Glenrothes and the Constellation are compared in the relationship of attainment to all the variables in Appendix III.

Chapter Nine

Differences in Reasons for Moving to the New Town and their Implications

The Third Hypothesis laid out in Chapter Three stated:

"The different reasons given for moving to a New Town will indicate differences of attitudes and behaviour and hence attainment amongst the children of those moving."

People moved to Glenrothes for three main reasons; a better job, a better house and a better environment. These three reasons together accounted for over three quarters of the reasons given for moving. However some 20% of those moving to the New Town moved for reasons other than these, although relatively few specified any other reason.¹

78 respondents from the New Town indicated that they had moved since coming to the town,² and most of these had done so because they wanted a better house. This was also the most common reason for moving for respondents from the Constellation.

Table 9.1. Reasons given for the last move

Reason for moving	All Respond- ents in Glenrothes		Those not mov- ing since arrival in Glenrothes		Those moving since arrival in Glenrothes		All Respond- ents in the Con- stellation	
	No.	%	No.	%	No.	%	No.	%
A better job	78	24.6	67	28.0	11	14.1	6	9.8
A better house	99	31.2	59	24.7	40	51.3	35	57.4
A better environment	73	23.0	62	25.9	11	14.1	6	9.8
Other reasons	67	21.1	51	21.3	16	20.5	14	23.0
Total	317	100	239	100	78	100	61	100

The distribution of reasons for moving to Glenrothes for respondents who had not moved since arrival was significantly different from the distributions of reasons for respondents who had moved since arrival in the New Town, and for respondents in the Constellation. The Chi Squared test indicated a probability of less than .001 in both cases. i.e. a very significant difference. (table 9.1) Reasons for

moving to the New Town were thus significantly different from reasons for moving within it, and from reasons for moving in the Constellation.

1. Differences in Attainment between groups giving different reasons for moving to the New Town

Table 9.2 Average Scores on the Attainment Tests by reason for moving to Glenrothes

Test	A Better Job (No.)	A Better House (No.)	A better Enviro- ment (No.)	Other Reasons (No.)	All movers in the Constellation (No.)
Picture '69					
Intelligence	74.792(26)	66.792(23)	72.739(24)	68.833(22)	65.045(31)
Picture '70					
Intelligence	78.889(9)	76.500(8)	68.200(7)	74.700(8)	68.800(16)
Reading '69	28.348(27)	26.935(22)	28.955(24)	26.667(23)	26.381(31)
Reading '70	28.000(9)	28.583(8)	27.556(6)	26.100(8)	24.500(16)
Mathematics '69	67.520(27)	57.250(23)	68.000(23)	57.792(23)	54.737(32)
Mathematics '70	55.222(9)	57.917(8)	46.778(7)	52.500(7)	45.500(17)
Verbal					
Reasoning '73	109.205(67)	103.980(59)	103.397(62)	105.791(51)	105.767(61)
Verbal					
Reasoning '74	104.885(67)	99.909(59)	99.959(62)	102.149(51)	100.717(61)

On four of the eight tests the average scores of those who had moved for 'a better job' were higher than those who had moved for any of the other reasons and on the other four tests, second highest. (table 9.2) T-tests revealed the average performance of this group to be significantly better (.001 level of probability) than that of all the other groups. The advantage in performance of those having moved for 'a better environment' over those who had moved for 'a better house' just reached the .05 level of significance.

Thus the different reasons given for moving gave rise to differences in attainment amongst the children of those moving.

However it was necessary to investigate whether this relationship could have been due to a number of possible intervening variables.

2. Differences in Social Class between groups giving different reasons for moving to the New Town

Table 9.3. Differences between Manual and White Collar Workers in reasons given for moving to Glenrothes

Reasons for Moving	White Collar Workers		Manual Workers		Rating on Social Class Index*
	No.	%	No.	%	
A better job	45	37.5	45	24.5	3.23
A better house	18	15.0	61	32.5	3.86
A better enviroment	20	17.5	54	29.0	3.87
Other reasons	36	30.0	27	14.5	3.11
Total	119	-	187	-	3.26

* A low number indicates a high proportion of higher Social Classes.

The Chi Squared test indicated that there was a significant (.02) difference in the distributions of reasons for moving given by manual and white collar workers.(table 9.3) The most frequent reason given by manual workers for their move, was that of 'a better house' and this was followed by 'a better enviroment'. The position for white collar workers was the reverse of this, in that the reason most frequently given by them was that of 'a better job' and more of them specified 'other reasons' for moving to the town than either of the other two reasons.

Plausible explanations for these differences can be readily provided. The tradition of high job aspiration in middle class culture together with the career structures associated with white collar work should influence the moves of those white collar workers to Glenrothes Similarly, poor housing and enviromental deprivation are most common in working class areas and should act as a spur to movement.³

The reason most frequently given by white collar workers ('a better job') was also the reason associated with the highest average level of attainment, and that reason most commonly given by manual workers, ('a better house') was associated with the lowest average level of attainment. Thus the reasons for moving are associated with social class and both are associated with educational attainment.

3. Reason given for last move, Social Class and Attainment

Table 9.4 Differences in attainment between groups giving different reasons for moving to the New Town, controlling for Social Class

Differences in scores between groups where the score of the lowest is '0'

	A better job	A better house	A better enviroment	Other reasons
Picture Intelligence '69	8.000	0	5.947	2.041
Controlling for Social Class	9.400	0	8.336	0.040
Reading '69	1.413	0.268	2.288	0
Controlling for Social Class	1.755	0	2.124	0.442
Mathematics '69	10.270	0	10.750	0.542
Controlling for Social Class	11.606	0	12.720	3.569
Verbal Reasoning '73	5.808	0.583	0	1.811
Controlling for Social Class	5.180	1.025	0	1.374
Verbal Reasoning '74	4.976	0	0.050	2.240
Controlling for Social Class	3.090	1.015	0	0.629

The sample sizes for the 1970 tests were too small for reliable comparisons to be made.

Differences in educational attainment between groups moving for different reasons were essentially unchanged after controlling for social class.⁴ The differences in verbal reasoning quotient (the two

tests with the full sample sizes) were slightly reduced, but the other test scores evidenced no distinct changes. The advantage of the children whose families had moved for 'a better job' remained when social class was controlled for and so appeared to be independent of social class considerations, whilst differences in educational attainment amongst children from families moving for other reasons were inconsistent and not significant.

4. Differences on other indicators between groups giving different reasons for moving to the New Town

Those who had moved to Glenrothes for 'a better job' differed markedly from the rest of the sample in many other respects. These differences were most noticeable in respect of factors known to be associated with educational advantage. The parents tended to have left school later, have better home amenities, visit libraries more frequently and the mothers, although not the fathers tended to help their children more frequently with schoolwork.⁵ They also evidenced least dissatisfaction with the school and tended to have the highest expectations of their child's school leaving age. Differences in this respect amongst those who gave other reasons for moving were not consistent and rarely significant.

Conclusions on the reasons of those moving to the New Town

Although parents in different social classes tended to give different reasons for moving to Glenrothes, social class was not found to have a significant bearing upon the average attainments of the children whose parents gave different reasons for moving. The children of families who moved in order to get 'a better job' scored significantly higher than the rest of the sample. These children tended to come from families whose home circumstances and parental attributes are known to be associated with high attainment.⁶

It was therefore possible to corroborate the Third Hypothesis and conclude that the different reasons given for moving to a New Town indicated differences in parental attitudes and behaviour and hence in the educational attainment of the children of those moving. The results also indicated that those moving to the New Town gave a different distribution of reasons for so moving than did those moving within the town or to or within the Constellation.

The reason given for the last move and differences in attainment between Glenrothes and the Constellation

Of the reasons given for the last move, that of 'a better job' was given most frequently (in 28% of cases) as a reason for moving to the New Town and least frequently (in less than 10% of cases) as a reason for moving in the Constellation. It was also the reason most highly associated with higher attainment. 'A better environment' was also associated with higher attainment and this was given as a reason for the last move much more frequently in the New Town than in the Constellation. However, as can be seen from table 9.2 in only three tests did any of the groups giving different reasons for moving to the New Town have a lower performance than that of the average for the Constellation. When the entire New Town sample (including those moving since arrival) was compared with that of the Constellation, this figure dropped to two tests, and after controlling for social class, as is shown in table 9.5, on only one test did children from the Constellation demonstrate any advantage in attainment over any of the New Town groups of children. It is therefore possible to conclude that whilst parents moving to the New Town did so for reasons associated with higher attainment amongst their children, such reasons do not account for the overall higher attainment of the New Town children.

Table 9.5 Advantage in score of New Town children from families giving different reasons for their last move over those of the Constellation, controlling for Class

Test		A better job	A better house	A better enviroment	Other reasons
Picture Intelligence	'69	8.671	2.245	8.352	2.716
Picture Intelligence	'70	13.186	10.834	3.740	4.982
Reading	'69	1.801	0.780	2.560	0.829
Reading	'70	3.920	4.561	3.944	1.732
Mathematics	'69	11.770	4.476	14.666	4.464
Mathematics	'70	11.712	14.408	3.938	7.987
Verbal Reasoning	'73	2.893	- 0.689	- 0.168	0.210
Verbal Reasoning	'74	3.477	0.081	1.286	1.038

A comparison of the scores of those who had moved within Glenrothes with those who had moved in the Constellation, as in table 9.6, revealed that the Glenrothes children had advantages on all eight tests. After controlling for social class, advantages increased on six of the tests. This comparison involved two groups for which the distributions of reasons given for the last move were not significantly different.

Table 9.6. The Attainment scores of those moving inside Glenrothes since arrival in the town compared to those in the Constellation indicating a reason for their last move

Test		Score of movers inside Glenrothes(No.)	Score of movers within Constellation(No.)	Difference in Scores	Probability of difference from chance	Difference controlling for Social Class
Picture Intelligence	'69	70.849(25)	65.045(31)	5.804	.247	6.306
Picture Intelligence	'70	77.909(9)	68.800(16)	9.109	.132	9.552
Reading	'69	26.674(24)	26.381(31)	0.293	.828	0.876
Reading	'70	29.273(10)	24.500(16)	4.773	.020*	4.535
Mathematics	'69	61.714(24)	54.737(32)	6.977	.271	7.449
Mathematics	'70	56.727(9)	45.500(17)	11.227	.037*	11.946
Verbal Reasoning	'73	106.153(78)	105.767(61)	0.386	.877	0.978
Verbal Reasoning	'74	103.012(78)	100.717(61)	2.295	.336	2.220

* Significant at the .05 level.

7

Although the different reasons given by parents for moving to the New Town may indicate differences in attitudes and behaviour which are associated with higher educational attainment, amongst their children those who moved for reasons not associated with these advantages tended to have children with higher scores than their counterparts in the constellation, as is shown in table 9.5. Similarly those who had moved since their arrival in the New Town gave a similar distribution of reasons for their last move as did those in the Constellation, but on all eight tests their children maintained higher average scores. (table 9.6).⁷

It can therefore be concluded that, whilst the different distribution of reasons given by those moving to the New Town may indicate differences in attitudes and behaviour associated with higher educational attainment amongst their children, and this may account for some of the differences in educational attainment between Glenrothes and the Constellation, this was not sufficient to account for the entire difference in the level of educational attainment between the two areas. It was therefore necessary to estimate the importance of the different reasons for moving in accounting for differences in attainment between the two areas.

Estimation of the importance of the different reasons given for the last move in accounting for differences in attainment between children from the two areas.

An analysis of variance revealed that, in Glenrothes, an average of about 6% of the total variance in attainment was accounted for by the different reasons given for the last move.

Table 9.7 Analysis of variance in attainment between different reasons given for the last move

Test		Total Variance	Variance between reasons	% of Variance between reasons	No.
Picture Intelligence	'69	270.9	14.3	5.27	118
Picture Intelligence	'70	167.9	21.0	12.50	41
Reading	'69	12.09	1.26	10.40	115
Reading	'70	14.59	1.13	7.72	41
Mathematics	'69	360.2	36.6	10.16	120
Mathematics	'70	232.0	22.8	9.84	40
Verbal Reasoning	'73	200.3	6.8	3.42	317
Verbal Reasoning	'74	192.2	5.6	2.92	317

It was not possible to perform a two way analysis of variance in order to compare the importance of the reasons given for moving, with that of social class, because the two phenomena were not independent of one another.⁸ Similarly it was not possible to perform a two way analysis of variance between areas and between reasons for moving because these two phenomena were also not independent of one another.⁹ It was therefore necessary to devise other ways of assessing the importance of the different reasons for moving given in Glenrothes and the Constellation in accounting for the different levels of educational attainment in the two areas.

Three methods were devised in order to do this:

- (i) A comparison of the educational attainments of children of parents having moved since arrival in Glenrothes, with the educational attainments of children in the Constellation.¹⁰ (The reasons given for moving by these two groups were not significantly different¹¹.)
- (ii) A comparison of the educational attainments of children of parents having moved since arrival in Glenrothes with those of parents having moved since arrival in the Constellation.¹² (In this way two groups having moved similar distances for similar reasons were compared. The reasons given for moving by these two groups were not significantly different.¹³)

(iii) A comparison of the educational attainments of children from both areas, controlling for the different reasons for moving given by respondents in Glenrothes and the Constellation.¹⁴

In all three methods social class was also controlled.

The results of the three methods are set out in table 9.8

Table 9.8 The differences in test scores between the areas accounted for by the different distributions of reasons given for the last move by the two samples

Test	Differences in score due to variation in reasons given								
	Differences in scores between Glenrothes and the Constellation			(i) Those moving since arrival in Glenrothes and all movers in the Constellation		(ii) Those moving within the locality for both areas		(iii) Controlling for different proportions of reasons given	
	Score	% of total difference		Score	% of total difference	Score	% of total difference	Score	% of total difference
Picture Intelligence '69	6.493	100		6.306	98	7.518	116	3.425	53
Picture Intelligence '70	9.872	100						8.433	85
Reading '69	2.305	100		0.876	38	1.285	56	1.000	43
Reading '70	4.096	100						3.475	85
Mathematics '69	8.458	100		7.449	88	5.872	69	2.453	29
Mathematics '70	10.903	100						10.775	98
Verbal Reasoning '73	2.905	100		0.978	33	0.552	19	-0.040	0
Verbal Reasoning '74	4.256	100		2.220	52	1.284	30	0.613	14
Weighted Mean ¹⁵	-	100		-	54	-	42	-	34

The results of the three methods of assessing the importance of the different reasons for moving given in Glenrothes and the Constellation in accounting for the difference in educational attainment between the two areas produce on range between 34% and 54% of the difference, with an average of 43%. Although the range is considerable, all three

figures are of the same order and all indicate that the different reasons given for moving by residents of the two areas do account for a large part of the advantage in educational attainment of New Town children.

Conclusion

Those who gave different reasons for moving to Glenrothes tended to differ from one another in certain other respects. In particular parents who had moved to the New Town for 'a better job' tended to have home circumstances, attitudes and activities which were associated with higher educational attainment for their children. The higher performance of these children did not appear to be significantly determined by social class, although there was an association between social class and reason given for the last move and between the reason given and attainment scores.

Of those who had moved to the New Town, significantly more had moved for reasons associated with higher attainment amongst their children, than had moved within the Constellation. This difference between the two areas accounted for between 34% and 54% of the difference in educational attainment between the two samples.

The corroboration of Hypothesis Three indicated that the reasons given for the last move were also indicative of differences in other attributes amongst those moving. Certain of these attributes were linked to the educational attainment of their children. From this it followed that the New Town was recruiting a population which was somewhat more favourable endowed with regard to the attainment of their children. In terms of levels of aspiration, parental education and parental literacy, those moving to the New Town for 'a better job' were so endowed. However those moving for reasons less favourably linked to such attributes also tended to have higher scoring children than those from the Constellation. The recruitment of a more favourably

endowed population contributes to the advantage in attainment of children in the New Town, but by no means accounts for all of it.

NOTES

1. See the Question 3 (iii) Appendix I, and Chapter Six Table 6.5 for the response rate.
2. These had been resident in the locality for a longer period than in their dwelling, this was ascertained from the questionnaire by comparing the answers to questions 8(i) and 8 (ii)
3. See Note 12 in Chapter Eight.
4. For the method of controlling for social class, see Chapter Five and Appendix V.
5. For these differences see Appendix IV. .
6. See Chapter Two pp.44-49.
7. Upon controlling for social class, those since arrival in the New Town scored higher than those moving since arrival in the Constellation on all five comparable tests:

<u>Test</u>		<u>Score Difference</u>
Picture Intelligence	'69	7.5
Reading	'69	1.3
Mathematics	'69	5.9
Verbal Reasoning	'73	0.6
Verbal Reasoning	'74	1.3

8. See Table 9.3
9. See Table 9.1
10. Only the scores of children of those parents answering question 8(iii) on the reason for their last move were compared.
11. See Table 9.1.
12. See Note 7.
13. 27 of the Constellation sample had moved inside the area. The reasons given were:

	<u>Constellation</u>		<u>cf Glenrothes Group</u>	
	No.	%	No.	%
A better job	2	7.4	11	14.1
A better house	13	48.1	40	51.3
A better enviroment	4	14.8	11	14.1
Other Reasons	8	29.6	16	20.5
	27		78	

14. Controlled in the same manner as social class, see Appendix V.
15. The weighted mean was determined by the sample sizes for each of the tests.

Chapter Ten

The Effects of Length of Stay in the New Town

In Chapter Three, two hypotheses, relating educational attainment and length of stay in the New Town were set out. Hypothesis Four dealt with the level of attainment:

"Within similar social and economic circumstances, educational attainment will correlate with length of stay in the New Town."

Hypothesis Five dealt with the stratification of attainment:

"The longer the residents have been in the town, the smaller the differences in attainment between the classes will be!"

Two indicators of length of stay were available. From the school records, the length of the stay of each child in New Town schools was available. From the questionnaires, the replies to a question on length of residence in the locality were available. This second indicator was based on a smaller sample size and used longer and probably less accurate measurements of time.¹ Both indices were used in the analysis.

A correlation analysis revealed contradictions in their relationships to educational attainment. Length of education correlated significantly with attainment on three tests, as is shown in table 10.1.

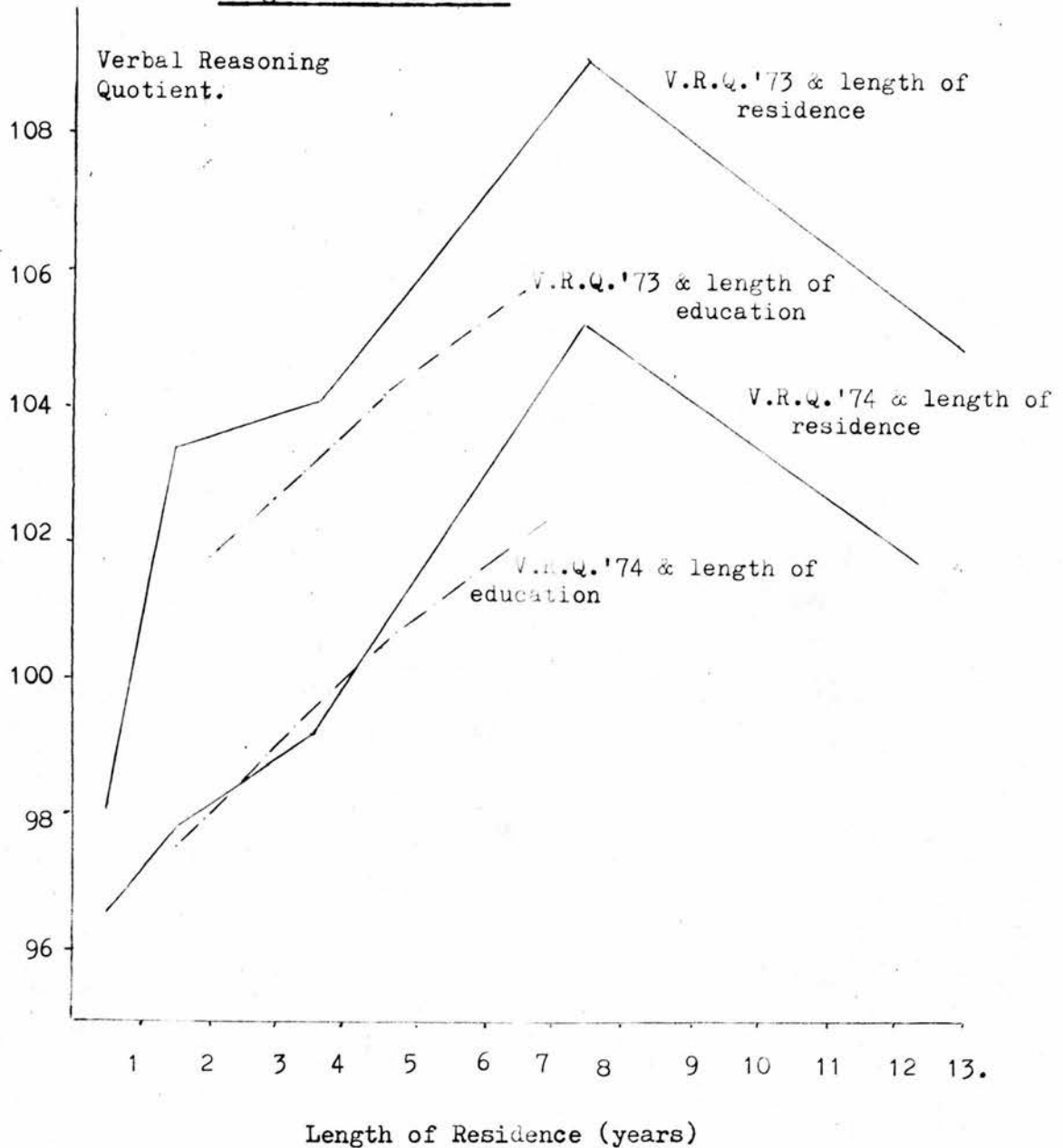
Table 10.1. Correlation coefficients between length of education in the New Town and educational attainment.²

Test	Pearson Coefficient	Kendall Coefficient	Spearman Coefficient	No.
Mathematics '69	-	.1534	.1946	197
Verbal Reasoning '73	.0997	.0690	.0929	489
Verbal Reasoning '74	.1241	.0757	.1022	488

All the coefficients shown were significant at the .05 level. The use of three coefficients militated against the possibility of freak results.

A graphical representation of the relationship of verbal reasoning quotient to length of stay on both indicators is presented in table 10.2.

Table 10.2. The Relationship between Verbal Reasoning quotient and length of stay as measured by length of education and length of residence



The results of the two indicators indicated similar relationships up to the period from seven to ten years of stay. Those resident over ten years had considerably lower scores than those resident between five and ten years, and this characteristic was the main reason for negating any significant correlation between verbal reasoning quotient and length of stay as measured by length of residence.

The tests of verbal reasoning were of greatest use because the attainment tests taken in 1969 and 1970 were not expected to be very effective in distinguishing between children with different lengths of education in the New Town as they evaluated only the first two years' impact of education, i.e. from five to seven years of age, whereas the tests of verbal reasoning were administered after six and seven years of primary education, and so did to some degree measure the impact of all the primary years. There was an average net increase of 30 children to the New Town's schools each year. Thus of the New Town sample only about 60 of the children tested in October 1969 or March 1970 had begun their primary education outside Glenrothes, compared to about 200 taking the tests of verbal reasoning.

Length of residence nevertheless did not show a significant correlation with attainment on either of these tests. The information on length of residence was gained from the questionnaire returns and was subject to the various response biases in attainment and social class already noted (i.e. Those returning the questionnaire tended to be of higher social classes and have children with higher educational attainment.)³ There was also a slight bias in response rate linked with length of residence, the longest resident groups tended to have higher response rates. This was noted after comparing the relationship between length of education and verbal reasoning quotient, for New Town children who returned the questionnaire, with the entire New Town sample. The result of the higher response rate amongst the longest resident was to include more lower scoring children in this group.⁴ This bias is shown in table 10.3.

Table 10.3. Average Verbal Reasoning Quotients by length of education in the New Town, as indicated by the total sample and from the questionnaire returns

<u>Length of Education</u>	<u>Whole Sample</u>	<u>From Questionnaires</u>	<u>Difference</u>
(i) Less than three years	99.405	99.366	0.039
(ii) From three to six years	102.374	105.950	3.576
(iii) More than six years	104.218	105.471	1.253
Bias between groups (ii) and (iii)			2.323
Bias between groups (ii) and (iii) after controlling for social class.			2.144

This bias would entail an underestimation of the average quotient of those with more than six years education in Glenrothes, of over two points, when compared with those with between three and six years education. A replication of this bias in a comparison of groups resident over ten years and between five and ten years would result in almost the observed difference in educational attainment between the two groups.

Table 10.4. Differences in Verbal Reasoning Quotients between those resident in Glenrothes between five and ten years and those resident over ten years

<u>Test</u>	<u>Quotient Difference</u>	<u>Difference Controlling for Social Class</u>
Verbal Reasoning '73	5.231	2.886
Verbal Reasoning '74	3.963	2.759
Average	4.597	2.823

However it was not possible to determine whether or not such a bias did exist. Even if it did, it is clear that although the final gradients in figure 8.2 would be much reduced, they would not be reversed. It is therefore clear that verbal reasoning ability did not have a linear relationship with length of stay in the New Town, certainly for those who were residents for ten years or more. There was therefore a fairly well established relationship up to ten years residence, but not beyond it.

On seven of the eight tests, those children who had six or more years education in the New Town (i.e. all or nearly all their primary education) scored higher than those who had less than six years education in Glenrothes, as is shown in table 10.5., on the two tests of verbal reasoning this was significant beyond the .05 level. On the latter two tests this advantage remained after controlling for social class, as is shown in table 10.6. The difference between the two groups averaged out at around three quotient points over all the tests.⁵

Table 10.5. Scores of children with over six years and under six years education in the New Town

<u>Test</u>		<u>Under 6 years</u>		<u>Over 6 years</u>		<u>Difference</u>	
		Score	No.	Score	No.	Score	Proby.
Picture Intelligence	'69	70.278	(18)	68.793	(174)	-1.485	(.760)
Picture Intelligence	'70	64.400	(10)	70.076	(53)	5.676	(.506)
Reading	'69	26.412	(17)	27.362	(177)	0.960	(.320)
Reading	'70	22.111	(9)	26.564	(55)	4.453	(.253)
Mathematics	'69	58.667	(18)	62.207	(179)	3.540	(.539)
Mathematics	'70	48.889	(9)	49.593	(54)	0.704	(.908)
Verbal Reasoning	'73	102.837	(166)	105.997	(323)	3.160	(.021)
Verbal Reasoning	'74	99.084	(166)	102.438	(322)	3.454	(.012)

Table 10.6. Verbal Reasoning Quotients for children resident for less than three, from three to six and more than six years education in Glenrothes

Length of Education	V.R.Q.	Difference between groups	Difference controlling for Social Class	V.R.Q.	Diff-erence between groups	Diff-erence controlling for Social Class
	1973 (No)			1974 (No.)		
Under 3 yrs.	101.291(79)	2.950	1.829	97.519(79)	2.987	2.683
From 3 to 6 yrs.	104.241(87)			100.506(87)		
		1.756	1.669		1.932	1.777
More than 6 yrs.	105.997(323)			102.438 (322)		

On the five tests with large enough sample sizes, a similar advantage to the longer resident group was indicated by comparing groups resident five or more years in the New Town with those resident less than this time, as in table 10.7.

Table 10.7. Scores of children with over five years and under five years residence in Glenrothes

<u>Test</u>	<u>Under</u> <u>5 years</u>		<u>Over</u> <u>5 years</u>		<u>Difference</u>	
	Score	No.	Score	No.	Score	Proby.
Picture Intelligence '69	68.00	18	70.12	107	2.12	(.837)
Reading '69	25.83	18	27.74	105	1.90	(.255)
Mathematics '69	42.50	19	62.61	109	20.17	(.089)
Verbal Reasoning '73	102.73	90	106.63	248	3.90	(.020)
Verbal Reasoning '74	98.30	90	102.97	248	4.67	(.003)

The relationship between length of education in the New Town and attainment could have been the result of some factor independent of them both. Several of these possibilities were controlled for in a partial correlation analysis,⁶ the results of which are shown in table 10.8.

Table 10.8. Correlation coefficients between verbal reasoning quotient and length of education in the New Town, controlling for other relevant indicators

<u>Indicators Controlled</u>	Coefficient with <u>V.R.Q. '73</u>	Coefficient with V.R.Q. <u>'74</u>
-	.0997	.1241
Social Class, & overall length of education.	.1130	.1335
Social Class, overall length of education & maternal occupation	.1267	.1467
Social Class, both order & family size.	.1097	.1325

All the partial correlation coefficients above are larger than the simple coefficients thus demonstrating that the relationship is neither the result of a longer education nor of social class, maternal occupation, birth order or family size.

The possibility that the advantage of the longer resident pupils could be due to them coming from backgrounds more favourably endowed because of changes in the nature of the immigrant population over the last ten years was also considered. This was investigated as in the last chapter by focussing on the reasons given for the last move.

Table 10.9. Interrelationship of Length of education in the New Town and the reason given for the last move

<u>Reason</u>	<u>Under 3 years</u>		<u>From 3 to 6 years</u>		<u>Over 6 years</u>	
	No.	%	No.	%	No.	%
A better job	8	19.5	13	28.3	38	21.8
A better house	4	10.0	11	23.9	70	40.2
A better enviroment	11	26.8	13	28.3	35	20.1
Other reasons	18	43.9	9	19.6	31	17.8
Total	41	100	46	100	174	100

In the previous chapter, it was noted that those moving for 'a better house' were likely to have children with lower attainment scores⁷ than those moving for any other reasons, yet the proportion moving for this reason diminished over time from 40% for over six years stay to 10% for under three (table 10.9) whilst the average level of attainment also diminished over these groups, an unexpected trend. Also the proportion moving for either 'a better job' or 'a better enviroment' (both associated with higher attainment) was lowest amongst those with over six years education. There appeared to be no positive relationship between length of education, educational attainment and reason given for the last move.⁸ This was demonstrated by controlling for the reason for the last move⁹ (table 10.10)

Table 10.10. Difference in average verbal reasoning quotient between those resident more than six and less than three years in the New Town

<u>Difference</u>	<u>Difference controlling for Social Class</u>	<u>Difference controlling for Social Class and reason for last move</u>
4.813	3.979	4.519

The relationship between length of education in the New Town and verbal reasoning ability was independent of the other possible determining variables investigated. The correlation analysis indicated that about 2% of the variance in attainment was accounted for by the length of education in the New Town.¹⁰ An analysis of variance based on the three groups with lengths of education, under three years, from three to six years and over six years (table 10.11) indicated that length of education might account for as much as $3\frac{1}{2}\%$ of the total variance, a quantity of a similar order.

Table 10.11. Variance in attainment between groups with different lengths of education in the New Town

<u>Test</u>	<u>Total variance</u>	<u>Variance between groups</u>	<u>% of total variance</u>	<u>No.</u>
Verbal Reasoning '73	217.403	7.373	3.391	488
Verbal Reasoning '74	201.571	7.946	3.942	489
Average	209.487	7.660	3.657	-

Conclusions upon the Association of Length of Stay in the New Town with Educational Attainment

In considering the association of attainment with length of stay up to ten years, or with length of education in the New Town, a small but consistent relationship emerged. This relationship involved a significant positive correlation between attainment and length of stay, and was independent of other possible determining characteristics. The length of stay accounted for no more than $3\frac{1}{2}\%$ of the total variance in attainment in the New Town, i.e. about half that accounted for by the different reasons given for moving to the town, and about a fifth of that accounted for by social class.¹¹

However, when a length of stay beyond ten years was considered, this positive association ceased. Differences in reasons given for the last move did not indicate that the longest residents were different in

any distinctive way from those more recently arrived.

This latter point made the corroboration of the Fourth Hypothesis not possible. This falsification may have been due to the fundamental lack of a relationship between attainment and length of residence, but it appears that a relationship other from one of simple correlation existed. That the relationship operated over the entire length of primary education indicates that some facet of the New Town's schools may be decisive. There might also be a maximum threshold to possible improvement, which is in line with the findings of Klineberg, Lee and Bloom,¹² or the discontinuity in the relationship at ten years residence may have been due to the earlier migrants being of a different character to the later ones. Although the reasons given for the last move did not reveal any significant differences, such an indicator is necessarily crude, and more subtle differences may be easily hidden. Such a discontinuity would fit in with the radical change in the towns industrial base in the early sixties.¹³

Differences in Attainment between Social Classes, and Length of Stay in the New Town

The two indicators of length of stay in Glenrothes manifested the same contradictions as in their relationship to the average level of educational attainment.

Table 10.12. Class differences in verbal reasoning quotient for different lengths of stay in the New Town

(all the figures relate to the average of both tests of verbal reasoning)

(i) As indicated by length of education

Quotient difference between classes	Under		From 3		Over	
	3 years	No.	to 6 years	No.*	6 years	No.*
Classes I-II and Classes IV - V	12.885	(10)	8.872	(14)	6.698	(58)
Classes I-II and Class III	7.218	(21)	5.443	(30)	5.595	(62)
Class III and Classes IV - V	5.666	(10)	3.429	(14)	1.103	(58)

* The number refers to the number in the smaller of the two groups.

(ii) As indicated by length of residence

<u>Quotient difference between classes</u>	<u>Under 5 years</u>	<u>From 5 to 10 years</u>	<u>Over 10 years</u>
Classes I-II and Classes IV - V	7.084 (11)	-4.944 (8)	12.323 (15)
Classes I-II and Classes III	5.524 (24)	3.260 (27)	8.109 (28)
Class III and Classes IV - V	1.080 (11)	-8.204 (8)	4.338 (15)

The two tables indicate completely different relationships. That produced by using the length of education as a yardstick indicates decreasing class differences with length of education in the New Town. That produced by using the length of residence as a yardstick indicates no simple relationship, this table indicates that amongst those resident between five and ten years in the New Town, children from social classes IV and V outperform those from social classes I, II and III. This phenomenon is probably the result of sampling error.¹⁴ The bias in response rates on the questionnaire was both to higher attainment and to higher social class.¹⁵ The result of this was that the cell containing all those in the New Town in semi-and unskilled jobs resident between five and ten years included less than 10 individuals, who may have had highly unrepresentative attainment scores.¹⁶

A further investigation of the differences indicated between the social classes by length of education in the New Town revealed certain significant differences as shown in table 10.13.

Table 10.13. Decrease in class differences in attainment between different lengths of education in the New Town

<u>Quotient difference between classes</u>	<u>Test</u>	<u>Between un- der 3 and from 3 to 6 years (Proby)</u>	<u>Between from 3 to 6 yrs. and over 6 years (Proby)</u>	<u>Between un- der 3 and over 6 yrs. (Proby)</u>
Social Classes I - II and Social Classes IV - V	V.R.Q.'73	5.553(.05)	0.652	6.205 (.01)
Social Classes I-II and Social Class III.	V.R.Q.'74	2.472	3.697 (.05)	6.169 (.01)
Social Class III and Social Classes IV and V	V.R.Q.'73	3.560	-1.206	-2.354
	V.R.Q.'74	0.009	0.902	0.893
	V.R.Q.'73	1.993	1.858	3.851
	V.R.Q.'74	2.481	2.795	5.276

Of the eighteen comparisons in the table 10.13, sixteen indicate a decrease in class differences with longer length of education and five are significant beyond the .05 level of probability. Such evidence tends support to the Fifth Hypothesis that class differences in attainment are less amongst those longest resident in the New Town.

The situation regarding the relationship between class differences in attainment and length of stay in the New Town was very similar to that between level of attainment and length of stay. The association of decreased class differences amongst those children with the longest stay in the New Town was indicated by the length of education derived from the school records, and not contradicted by information on length of residence gained from the questionnaire. However, when a period beyond five or ten years was considered, the data indicated increased class differences in attainment, and hence precluded the corroboration of the hypothesis under consideration.

Conclusions

Neither Hypothesis Four nor Hypothesis Five could be fully corroborated. The data indicated that the level of attainment increased and class differences decreased with length of stay in the New Town, up to a period between seven and ten years residence. In both cases, the more reliable data from the school records on length of education indicated the corroboration of both hypotheses, and these trends were not contradicted by information on length of residence gained from the questionnaire over that length of time required from primary education. However the trends were distinctly contradicted by information on those resident over ten years. It is unlikely that this can be accounted for by the response bias, although it should be noted that the data base with regard to attainment was effectively restricted to information on verbal reasoning ability.

The trends were small but consistent in the period up to ten years residence in the New Town, whereafter the relationships ceased. Three explanations can be put forward to account for this phenomenon. The first involves the schools in Glenrothes being significantly superior to those elsewhere, and hence centres on the educational facilities of the town as being of prime importance in bringing the benefits of higher attainment and smaller class differences in attainment. This is unlikely because no significant differences were found between schools in Glenrothes and the Constellation.¹⁷ The second speculates upon there being a change in the pattern of migration in the mid to early sixties, such that those who entered the town before that time from a population of a slightly different nature to those arriving since that time. The change in the industrial base of the town around that date, when dependence upon coalmining ceased, and other sources of employment were attracted to the town, provides circumstantial evidence for this latter point of view.¹⁸

The third possible explanation lies in considering there to be some upper limit to the improvement of educational attainment which a beneficial environment can provide. This was the view of Jensen when he commented on the 'Headstart' programme of nursery schools in the U.S.A.,¹⁹ and is also a view accepted by many other social scientists of very different leanings, when applied to particular environments. Both Klineberg and Lee²⁰ when looking at the educational performances of Southern Blacks moving to the 'more stimulating' environments of New York and Philadelphia, noted a levelling off in educational improvement after a certain period of residence in the new environment; Lee noted this levelling off to take place after five years residence for children moving into Philadelphia at the age of six.²¹ The results

obtained for Glenrothes with regard to linear improvements in attainment up to seven or so years residence in the New Town render this explanation particular relevance.

The latter two explanations are not incompatible and may well complement one another, in explaining the improvement of educational attainment with length of stay in the New Town up to the end of primary education in the stable social and economic situation prevalent in the 1960s, and also the diminution of class differences during that period.

Whatever the relationship of length of stay to attainment its effect was small, it accounted for no more than half the variance in attainment accounted for by the different reasons given for moving to the town and for no more than a fifth of the variance accounted for by social class.²²

NOTES

1. Length of education was measured in terms, whereas length of residence was measured: up to one year, two years, five years, ten years and over ten years.
2. These coefficients are for New Town residents only.
3. See Chapter Six. pp.123-124.
4. See Chapter Six. pp.123-126.
5. See Appendix I p262-265, for conversion of scores to quotients.
6. It was not necessary to control for length of residence, as the effects being investigated were the result of conditions before residence in the New Town and were therefore independent of any effects associated with length of residence in the New Town.
7. Chapter Nine p.167 table 9.2
8. No significant difference was noted by the Chi Squared test.
9. See Chapter Nine and Appendix V
10. The relationship of variance to correlation coefficients is given in Chapter Eight. p.162 note C.
11. See Chapter Eight, table 8.3, and Chapter Nine, table 9.7.
A two way analysis of variance was not possible because length of stay, reason for last move and social class were inter-related.
12. Chapter Three, note 10.
13. See Chapter Four pp.82-84.
14. See Chapter Two pp 48-49.
15. Chapter Six pp.123-126.
16. See Appendix V for the assumptions of the T-test.
17. Chapter Eleven. p.201.
18. See Chapter Four. pp.82-84.
19. Jenson, (op.cit.)
20. Klineberg. (op.cit) Lee. (op.cit)

21. Cited in Bloom (op.cit) pp.68-72.

22. See note 11.

Chapter eleven

Differences between Neighbourhoods

and Schools

The Sixth Hypothesis laid out in Chapter Three was:

"Educational Attainment will be positively linked to both the social structure and the age of the precinct."

This hypothesis was examined with regard to two sets of data. The first of these was that of the sample of schoolchildren used as a basis for evaluating the other five hypotheses. The second was the aggregate data compiled for each school and precinct. In both Glenrothes and the Constellation the catchment areas of the schools were clearly defined. In all but one case, the boundaries of the catchment areas in Glenrothes were the same as those of the precincts, and this one case involved only a very small number of pupils (i.e. less than 1% of the sample.)¹ and was a temporary measure to relieve overcrowding at one school. This situation facilitated the fuse of aggregate data from these two sources of school and neighbourhood.

A simple correlation analysis was performed with regard to the educational attainments of the children in the sample and the social class index of the precincts in which they lived but no significant coefficients emerged.² Similarly no significant correlation coefficients were found between the educational attainments of the sample and the ages of the precincts in which they lived. A correlation of the aggregate attainment scores of the schools with the social class index of each precinct also did not reveal any significant coefficients, nor did correlation between the age of the precinct and the aggregate attainment scores of the schools.

However other characteristics of the school and the neighbourhood did have significant relationships with educational attainment. The comparability of school and neighbourhood data enabled a further investigation of these relationships.

1. The Schools

Because the catchment areas of the schools were virtually identical with the boundaries between precincts in Glenrothes and with the clearly defined towns and villages of the Constellation, the schools can be described as neighbourhood schools. In the case of such schools it is particularly difficult to disentangle the effects of the school on the educational attainment of the school-children from those of the neighbourhood. In some cases, interactions between school and neighbourhood may also effect educational attainment. This is because primary schools are a part of the neighbourhood in which they are situated. Their role in this respect, as 'community schools' has been encouraged and emphasised since the Plowden Report.³

Some 40 characteristics⁴ relating to the school itself, its staff and its pupils were collected from each school and from the Education Authority. Amongst these 40 characteristics were the criterion variables of educational attainment aggregated over five years and based on the performances of about 2,700 pupils in Glenrothes and the Constellation between 1969 and 1974.⁵

Table 11.1. Significant correlation coefficients between school characteristics and attainment criterion

(i) Average attainment levels. All coefficients were obtained by Spearman's method, except where marked () in which case they are Pearson coefficients.⁶

<u>Characteristic</u>	<u>Picture Intelli- gence</u>	<u>Reading Ability</u>	<u>Mathematics Ability</u>	<u>Verbal Rea- soning Ability</u>
% of pupils taking free meals.	- .6429		(-.6000)	
Incidence of vandalism and breaking and entering.	(-.6000)	-.6011	-.6094	-.7563

Rate of pupils turnover	.6224
Ease of taking books home.	.5729
No. of extra-curricula activities.	.7709

(ii) Proportions of high and low scores.

<u>Characteristic</u>	<u>Picture Intelligence</u>		<u>Reading Ability</u>		<u>Mathematics Ability</u>	
	High	Low	High	Low	High	Low
Staff turnover.				-.6961		(-.6168)
% of parents seeking interviews				(.5998) -.6224		(.7044)
% of pupils taking free meals.	-.7357	(.6377)				(.6969)
Free meals as a % of meals taken *			-.5557	-.5750		
Incidence of vandalism and breaking and entering.		(.6403)	-.6609			
Library books per child				(.7541)		

* These figures relate to percentage of meals which were free, as opposed to percentage of pupils taking free meals.

Of all the variables drawn from the schools, nine demonstrated a significant association with at least one of the attainment measures used (table 11.1). Of these nine characteristics, four would appear to be more characteristic of the neighbourhood than of the school, i.e. percentage of pupils taking free meals, free meals as a percentage of meals taken, incidence of vandalism and breaking and entering, and rate of pupil turnover. Between them, these three characteristics included 14 of the 22 significant correlation coefficients between school variables and attainment. The remaining five characteristics were:

- Percentage of parents seeking interviews.
- Facility of taking books home.
- Number of extra curricula activities
- Staff turnover.
- Library books per child.

The only correlate of 'library books per child' was the proportion of poor performers on reading tests, which is a most unexpected result and may be a statistical freak. Similarly the negative relationship between staff turnover and the proportion of poor performers on reading and mathematics tests was a peculiar one. It was probably due to the higher performance records of New Town schools, which also had a higher staff turnover rate than those of the Constellation. The percentage of parents seeking interviews correlated with the proportions of low performers on both reading and mathematics tests and appears to be the result of visits of concern over the child's poor performance. (This was confirmed by an analysis of parental questionnaires which revealed a relationship between very frequent visits to the school and poor attainment).⁷

The relationship of both the ease of taking books home and of the number of extra curricula activities to verbal reasoning scores, would appear a good result for progressive education policies. However they represent the only school, as distinct from neighbourhood, characteristics which had significant associations with attainment.

No characteristic of the staff including those about experience and qualifications apart from staff turnover was significantly correlated with attainment. Neither was school or average class size⁸ or policy with regard to homework significantly correlated with attainment.

The difficulties in establishing a clear and consistent relationship between any particular school characteristic and measurable educational attainments were dealt with in Chapter Two.⁹ The problem

of discriminating among the schools was made even more difficult because of the similarities between them. All the schools come under the Fife Education Authority and staffing and equipment were standardised throughout the area.¹⁰ Glenrothes was also the focal point for the Constellation¹¹ and provides much of the housing for incoming teachers for schools throughout Fife, and the characteristics of the staff coming into all the schools was similar. While the fieldwork for this research was underway, one headmaster moved from a school in the Constellation to one in the New Town. The small number of schools in the sample(13) did not aid the creation of statistically significant associations.

A comparison of those school characteristics which were related to attainment in the two areas did not reveal any significant advantages to the New Town. On only one variable did the Glenrothes schools demonstrate any noticeable advantage; extra curricula activities.¹² They benefited from their size in their ability to provide a wide distribution of such activities. On two, the advantage, lay with the Constellation schools; pupil turnover and proportion of parents seeking interviews.¹³ There was no evidence that the New Town schools conferred any greater advantage on their pupils than did those of the Constellation, although it should be noted that only material and other easily quantifiable differences were investigated.¹⁴

The investigation of the differences between schools did shed light upon differences in indicators more properly related to the characteristics of the neighbourhoods in which the schools are located and from which the children were drawn.

2. Differences between neighbourhoods

The relationship between the attainment scores and neighbourhood variables like the incidence of vandalism or breaking and entering, and the proportion of free meals taken was more consistent over different tests than that between attainment scores and school characteristics. Vandalism and breaking and entering were negatively related to all the abilities tested, as was the proportion of school meals taken (table 11.1). These two variables could easily fit into Wiseman's 'social disorganisation' and 'socio-economic' factors,¹⁵ and suggest that the immediate cultural and socio-economic environment of the school was at least as important as the characteristics of the school itself in influencing the children's educational attainment.

40 additional social indicators were obtained for each precinct from the Development Corporation and the area office of the Social Work Department.¹⁶ In a correlation analysis, eleven of these indicators were found to have significant coefficients with at least one of the measures of attainment used, as is shown in table 11.2.

Table 11.2. Correlation coefficients between social indicators for each precinct and average attainment for each school
(only significant coefficients are shown)

<u>Characteristic</u>	<u>Picture Intelligence</u>	<u>Reading Ability</u>	<u>Mathematics Ability</u>	<u>Verbal Reasoning Ability</u>
% of one parent families.	-.7331			
% under occupation		-.7599		
Level of car ownership.	.8961		.7423	.7619
% Social Class II	.7418			
% Social Class V	-.9294			
Families referred to Social Work department.	-.8977			

Children referred to Social Work Department.			-.7342
Children referred to the reporter	-.639	-.6230	-.7927
Social Work Area Office Caseload (except elderly)	-.6726	-.7637	-.7785
Total Area Office Caseload.	-.6570	-.7141	-.7189
Offenders.			-.8211

All coefficients were calculated by the Spearman method.

There were very strong negative relationships between all the measures of attainment except reading, and social work involvement. Of the eleven variables which were correlated with attainment, six were gained from the Social Work Department. A strong link between social work involvement and poor performance at school was indicated. This link was emphasised by the significant correlation coefficients between the percentage of one parent families and picture intelligence, and between, vandalism and breaking and entering and attainment generally, as shown in table 11.1.

Economic indicators were also positively related to attainment. Car ownership was strongly related to three of the four attainment measures, and the proportions in social classes II and V were clearly related to intelligence scores, while, as has already been pointed out in table 11.1 information from the schools revealed that the taking of free meals was related to low performance on all the types of test.

The only other neighbourhood variable which correlated significantly with attainment was under-occupation. This was an unexpected relationship and probably occurred because of the relationship between under-occupation and the life cycle. Under-occupation occurs before parents have any children or after the children have left home, and because of

this was most common amongst the oldest and the newest parts of the town,¹⁷ where attainment was lower. This latter phenomenon is discussed later.

The indicators of social work involvement were strongly intercorrelated with those of socio-economic background, as is shown in table 11.3.

Table 11.3. Correlation coefficients between indicators of social work involvement and those of socio-economic structure

	<u>Car</u> <u>Ownership</u>	<u>% Social</u> <u>Class II</u>	<u>%</u> <u>Unemployed</u>
Families referred to Social Work Department	-.7592		
Children referred to Reporter	-.8956	-.7665	.8334
Offenders referred to the Social Work Department			.7732
Caseload of Social Work Department	-.8371	-.7257	.7557

All coefficients were calculated by the Spearman Method.

The precincts within Glenrothes were similarly stratified on indicators of economic well-being, social class, social work involvement or educational attainment as is shown in tables 11.2 and 11.3.

The older parts of the town tended to have lower levels of car ownership, more social work involvement and more manual workers living in them, yet none of the correlation coefficients between the ages of either the school or the precinct and any of the measures of attainment used reached a significant level of probability. The age of the precinct did however achieve significant correlation coefficients with the percentage of one parent families (.9100), the percentage of overoccupation (.7281), and the level of car ownership(-.8659). A partial correlation analysis between age of precinct and the

attainment criteria, controlling for the percentages of social classes II and V revealed no significant results. Two of the coefficients were positive and two were negative.

Although the average level of attainment of the children was related to the social structure of the precinct no such relationship could be found between the age of the precinct and the level of educational attainment. The Sixth Hypothesis could not therefore be fully corroborated.

The precincts with consistently the highest scores were, however, not those with highest indices on the criterion of social class, but were those in the middle of the scale. The precincts with the highest proportions of social classes I and II resident were Pitteuchar, Tanshall, Newcastle and Caskieberran, and those with the highest proportions of social classes IV and V were Woodside and Auchmuty, whilst the precincts with the highest scores were South Parks, Rimbleton and Macedonia. South Parks was the most middle class of the three and contained a higher proportion of owner occupiers than any other precinct, but Rimbleton, the most working class, included fewer owner occupied houses in its catchment area than any other precinct.¹⁸ These three precincts also held a middle position with regard to age. Rimbleton was the first to be begun, in 1959, and the last to be completed, in 1960. The three schools of South Parks (1960), Rimbleton(1962) and Macedonia(1964) are of identical design.¹⁹ A breakdown of attainment by school is shown in figure 11.4.

A breakdown of the town into three main areas was in many ways appropriate; the oldest area of Woodside and Auchmuty with the small enclaves of Braid Drive and Alburne Park, the middle precincts of Rimbleton, South Parks and Macedonia, and the newest area of Tanshall,

Table 11.4 Comparative Performance of Each School on Five Attainment Tests*, controlling for Social Class.

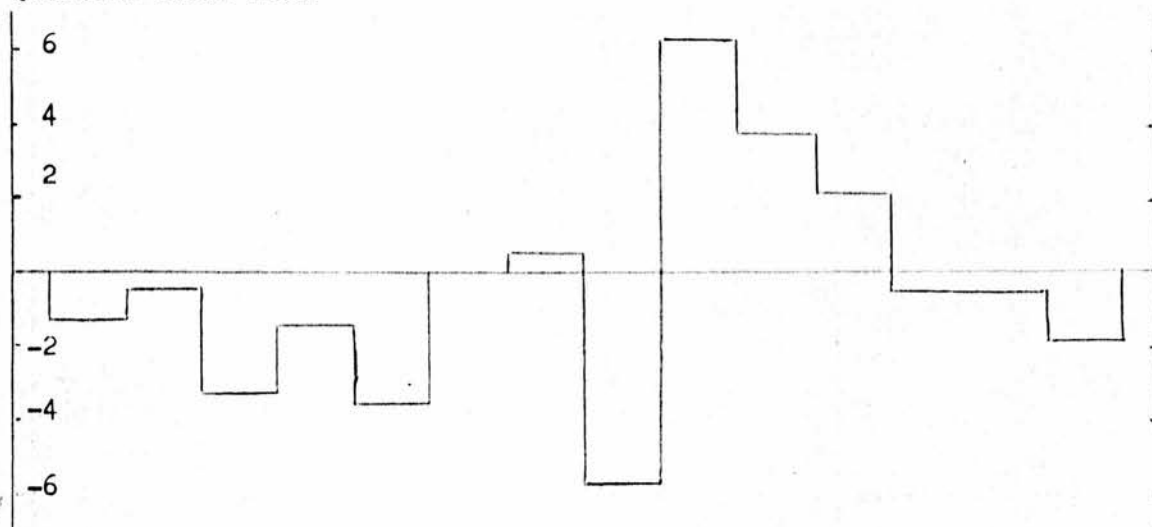
CONSTELLATION

GLENROTHES

Milton	Coaltown	Thornton	Marinch	Leslie	Carleton	Warcut	South Parks	Rimbleton	Southwood	Tarshall	Casbieberran	Pitteuchar
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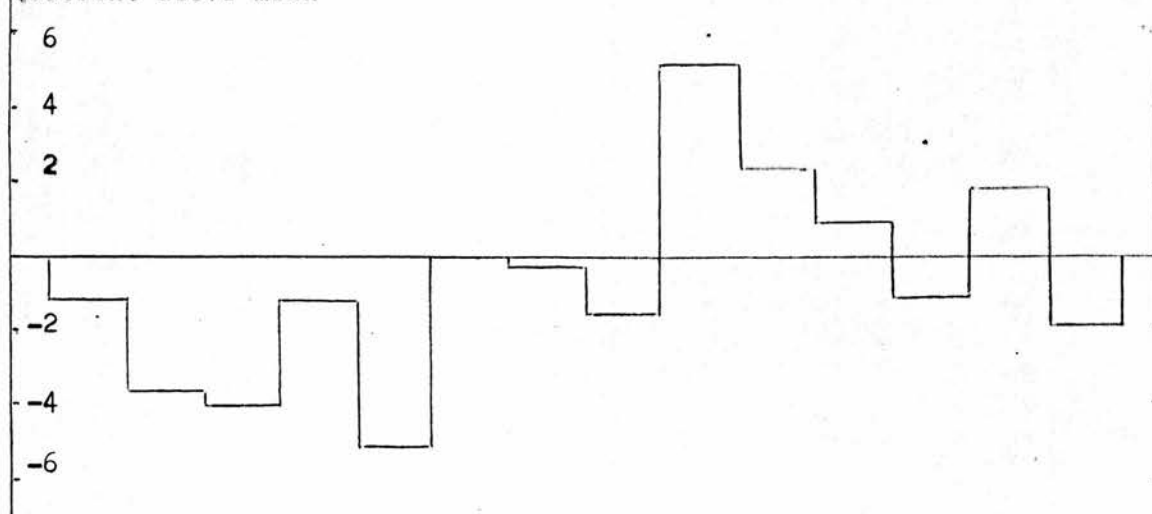
Verbal Reasoning Test 1973

Quotient above mean



Verbal Reasoning Test 1974

Quotient above mean



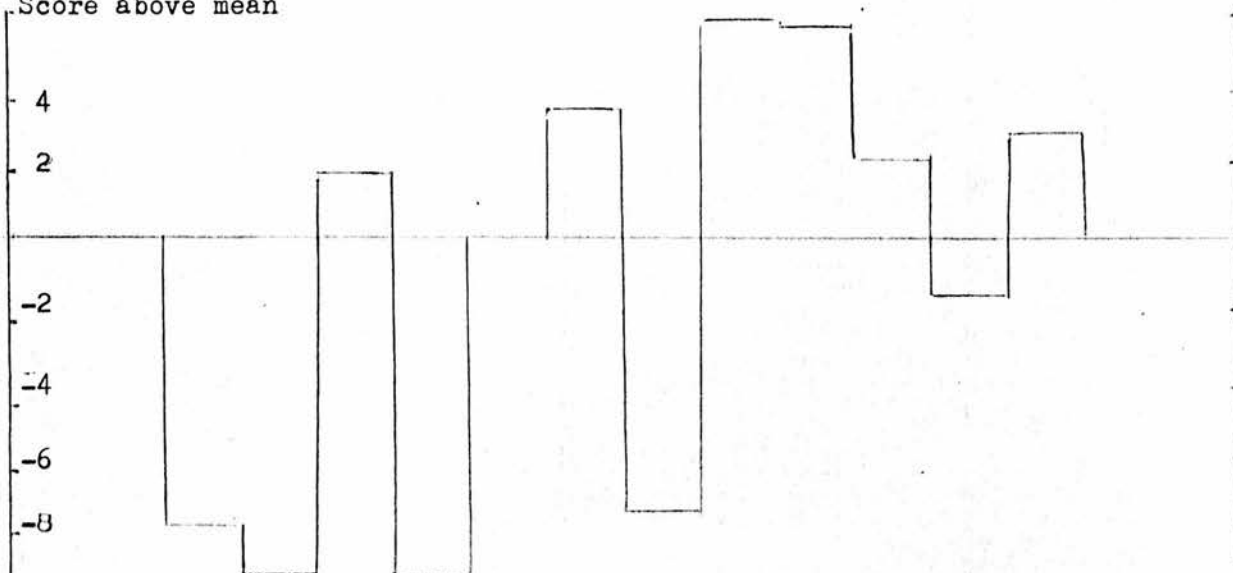
* The three tests of attainment administered in 1970 are not included because the sample sizes for certain schools were too small.

Milton
Coaltown
Thornton
Markinch
Leslie

Carleton
Warout
South Parks
Rimbleton
Southwood
Tanshall
Caskeiberran
Pitteuchar

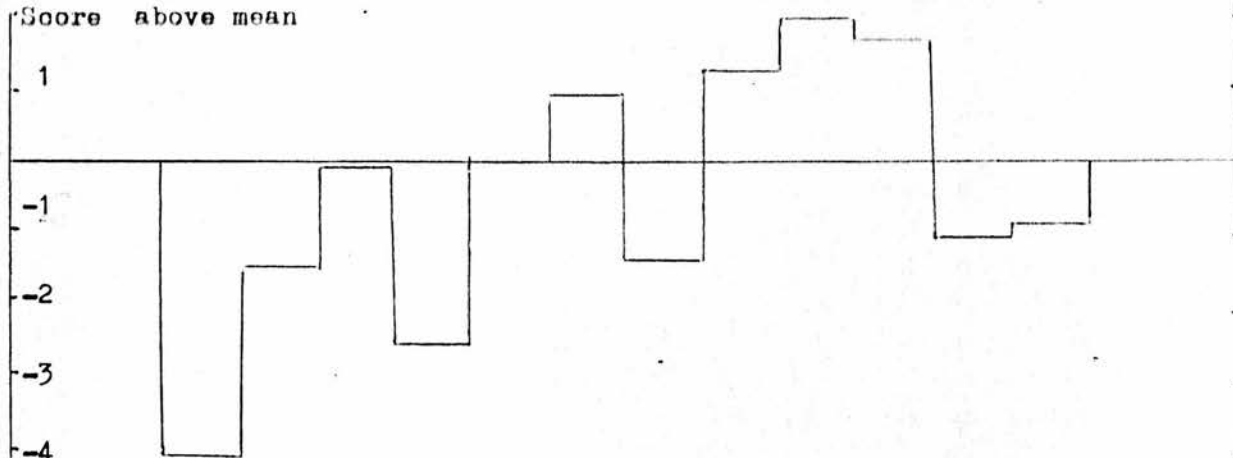
Picture Intelligence 1969

Score above mean



Reading Ability 1969

Score above mean



Mathematics Ability 1969

Score above mean

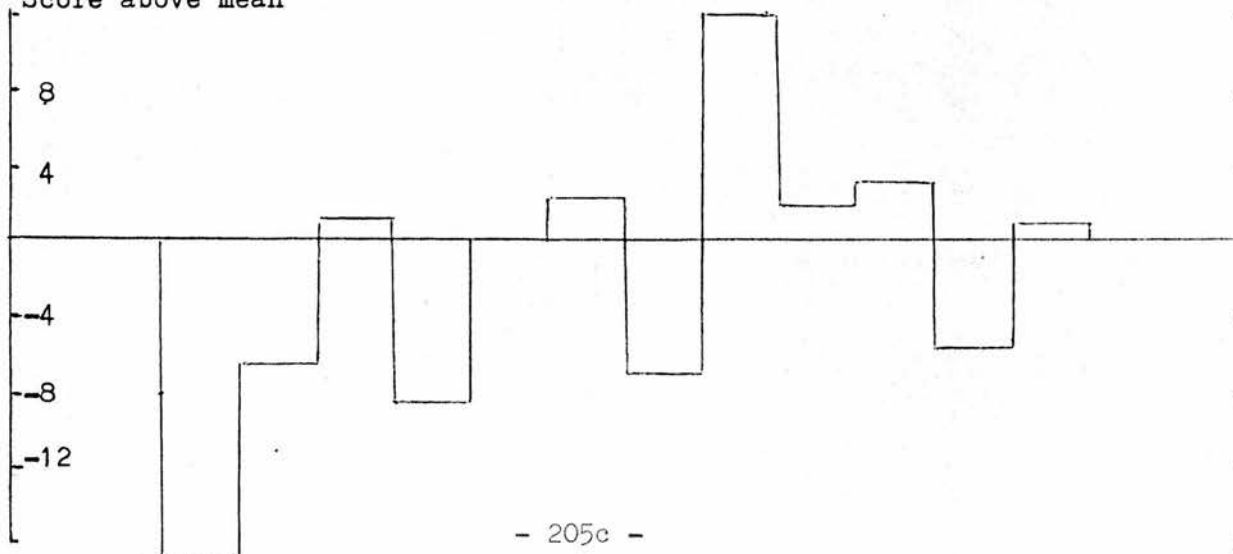
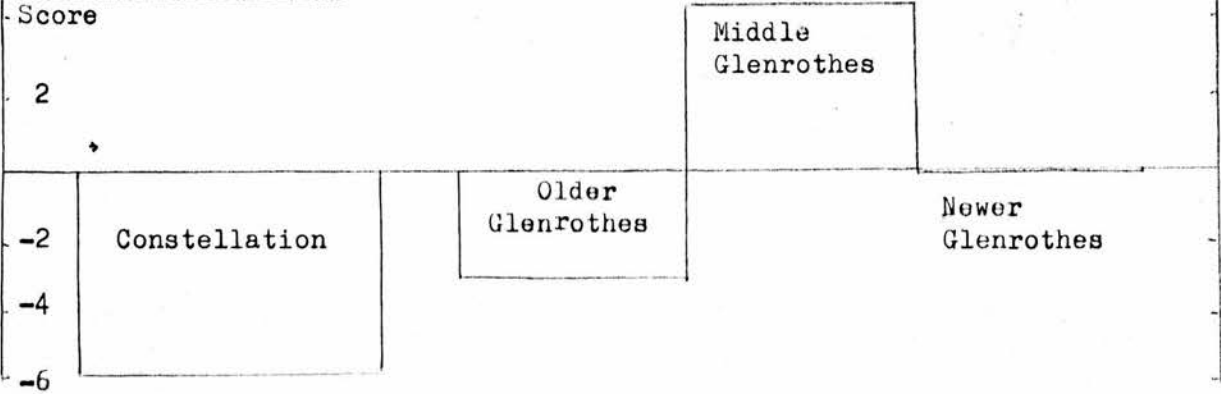
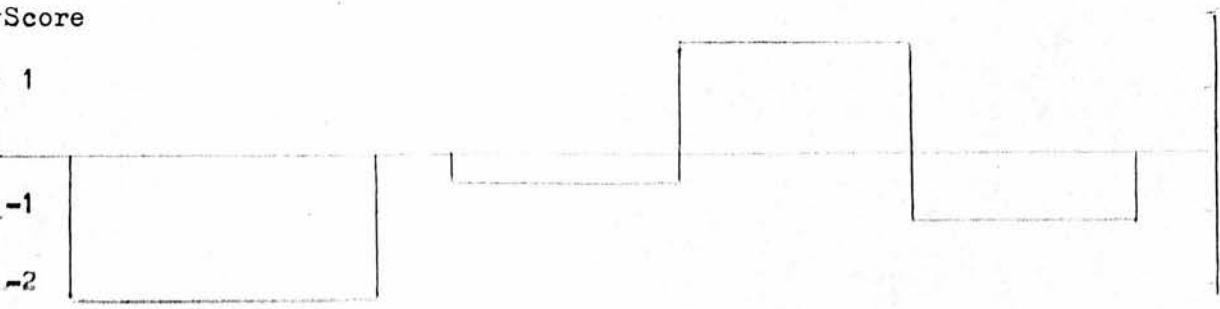


Table 11.5. Differences in Attainment between Areas , controlling for Social Class

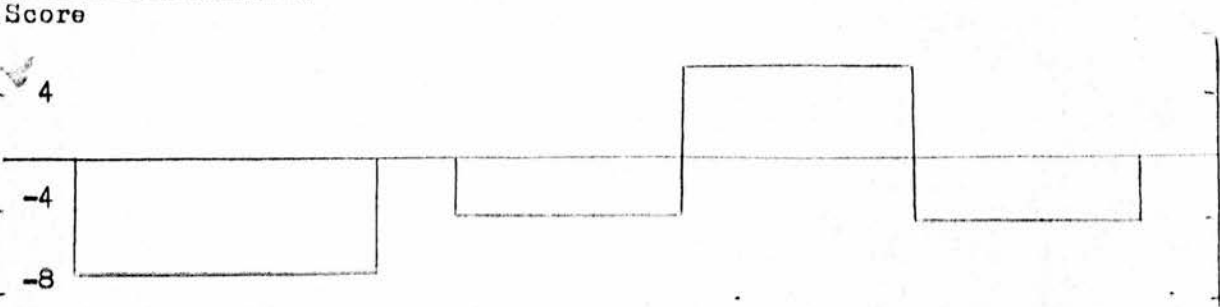
Picture Intelligence



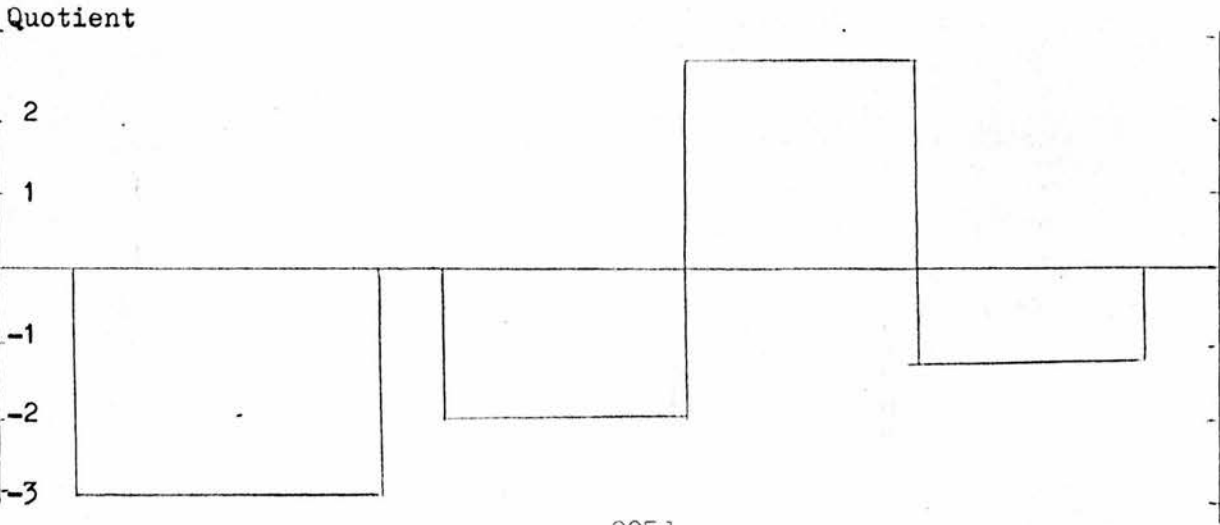
Reading Ability



Mathematics Ability



Verbal Reasoning Ability



Newcastle, Caskieberran and Pitteuchar. The oldest area contained the highest proportion of semi-and unskilled workers, and had the lowest attainment scores, whilst the newest area, although having the highest proportion of professional and executive workers, had only the second highest level of attainment.

However, after controlling for social class, the attainment differences between the oldest and newest areas disappeared, whilst that of the middle area remained higher than either of the other two. (figure 11.5.)

This was an unexpected result, although it is one which is consistent with the picture of increasing attainment with length of residence until around the ten year mark noted in Chapter Ten.

3. The Importance of Neighbourhood Differences

Table 11.6. Analysis of variance in attainment between schools

The Tests.	All 13 Schools			New Town Schools		
	Total Variance	Variance between schools	% of Variance between schools	Total Variance	Variance between schools	% of variance between schools
Picture Intelligence '69	363.5	48.9	13.5	330.6	25.6	7.8
Picture Intelligence '70	305.5	145.0	47.4	258.5	63.9	24.7
Reading '69	18.00	2.25	12.5	13.73	1.62	11.8
Reading '70	40.9	15.4	37.5	34.32	9.25	27.0
Mathematics '69	397.3	76.2	19.2	342.5	46.0	13.4
Mathematics '70	270.6	130.0	48.2	247.0	111.3	45.6
Verbal Reasoning '73	216.3	18.0	8.3	218.0	21.0	9.7
Verbal Reasoning '74	204.3	13.4	6.5	200.9	9.0	4.7
Weighted Mean			14.9			11.8

An analysis of variance on the eight attainment tests (table 11.6) revealed that the variance between schools or neighbourhoods accounted

for an average of 14.9% of the total variance on the tests. When Glenrothes alone was considered, the between schools variance accounted for a slightly lower 11.3% of the total variance in attainment within Glenrothes. In Glenrothes differences between schools and precincts account for less than one eighth of the total variance, and the figure for all the area is not significantly different. The remaining 85 to 90% of the total variance was accounted for by differences within schools, i.e. influences which are common to all the schools, and operate in all of them. The characteristics of the home and the parents will account for much of the variance within schools; the social class of the parents alone accounted for a greater proportion of the total variance (i.e. 18.8% for the whole sample) than did the characteristics of the neighbourhood in which they lived. That schools and neighbourhoods account for such a small proportion of the total variance is in part accounted for by their similarity, and by the similarity of the populations within them. This similarity was much greater than Wiseman or Warburton would have found in the Cities of Manchester and Salford.²⁰ A further analysis of variance in attainment between the two areas (table 11.7) revealed that the variance between the New Town and the Constellation was as great as that between the precincts within the New Town, an average of 11.3% of the total variance compared with 11.8% of the total accounted for between precincts.

Table 11.7. Analysis of variance in attainment between the
New Town and the Constellation

<u>The Tests</u>		<u>Total Variance</u>	<u>Variance bet- ween Glenrothes and the Constellation</u>	<u>% of Total variance bet- ween Glenrothes and the Constellation</u>
Picture Intelligence '69		363.5	38.9	11.0
Picture Intelligence '70		305.5	47.1	15.4
Reading '69		18.0	4.1	22.8
Reading '70		40.9	8.8	21.6
Mathematics '69		397.3	60.8	15.2
Mathematics '70		270.6	58.0	21.2
Verbal Reasoning '73		216.3	7.0	3.2
Verbal Reasoning '74		204.3	15.6	7.6
Weighted Mean				11.3

When the results of the above two analyses (presented in tables 11.6 and 11.7) are compared with those found by Wiseman in Manchester, the entire area appears markedly homogeneous. Wiseman found some 18% of the known variance in attainment accounted for by the schools and some 22% by the neighbourhood.²¹ In this survey only 14.9% of the overall variance is so accounted, and in Glenrothes the percentage is even lower at 11.8%. Yet such percentages are significant, they are greater than those found to be accounted for by reason for moving or by length of residence, which accounted for 5.6% and 3.5% of total variance respectively, although not as great as the average 18.8% of variance accounted for between classes in the whole sample (14.2% and 36.7% in the New Town and the Constellation respectively).²² That the variance between precincts was so small would indicate a relatively socially homogenous population and fits in well with the earlier conclusions about less rigid social stratification in the New Town.²³

4. Differences between the Precincts with Glenrothes

The differences between the precincts in attainment are consistent with the differences in attainment found between groups with different lengths of residence. In Chapter Ten it was shown that children with over ten years residence in Glenrothes tended to have attainment scores lower than those of children resident between five and ten years, but no lower than those of children resident less than this time.²⁴ At the time of this research (1974) both Anchmuty and Woodside had been completed for over ten years, in 1959 and 1955 respectively, Rimbleton (1967), South Parks (1964) and Macedonia (1966) for between five and ten years and all the remaining precincts with the exception of Taushall (1968) in the last five years, Caskieberran in and Newcastle in 1969 and Pitteuchar was unfinished.

It was also noted in Chapter Ten that social class differences in attainment were least for those children resident between five and ten years, compared with those resident either longer or shorter than this time.²⁵ In Chapter Eight it was noted that the lower social class differences in educational attainment amongst New Town children was associated with smaller social class differences in other respects, i.e. a less rigid system of social stratification.²⁶

These earlier finds and the revealed differences between the precincts shed light upon the social structure of the town and its social development. It does appear probably that the most homogeneous and least stratified areas were the three precincts of Rimbleton, South Parks and Macedonia, whilst the older and newer areas were associated with greater stratification and also lower levels of average attainment.

An explanation of the stratification of the older precincts can be most simply offered. The Alburne Park and Braid Drive areas account for something over half the total number of professional, managerial and intermediate workers in the Woodside and Auchmuty areas, and also the vast majority of the owner occupiers in the latter area.²⁷ In Auchmuty, all the owner occupiers live in Braid Drive whereas, in Woodside, a considerable number live in the old village. The standard of the houses in these two small developments, and the occupational status of those living within them far exceeded the overall levels for Pitteuchar, Newcastle or South Parks. The geographical separation of these two areas from the two most working class areas of the town made their social differences from them more easily noticeable.²⁸

Some 40% of the dwellings in Woodside antedated the New Town itself. A considerable number of the inhabitants of the precinct probably were either the original inhabitants or their children. The industrial base of the town prior to 1960 determined that the population of these two areas should be mainly made up of manual workers. Before that date, Glenrothes was described as a 'mining settlement' to serve the Rothes Colliery.²⁹ The workforce demanded by mining in the 1950s was predominately manual, and maintained the traditional stratification of mining communities.³⁰ Although the Rothes Pit ceased to function in 1962, considerable members of its former colliers remained in the New Town, although many transferred to other work.³¹

The houses in the two precincts were thus older than those in the rest of the town, and hence less desirable to new migrants. They lacked garages or garage space, as well as such internal amenities as central heating. Both of these factors tend to ensure that more affluent tenants opt for the better serviced but more expensive newer

housing. This trend has been reinforced by a housing policy designed to fit the means of tenants to the demands made upon them by rent and fuel bills. About a quarter of the dwellings in Auchmuty were flats, almost always at the bottom of most tenants preference lists for house-type.³²

The failure of the Rothes Pit and the subsequent uncertainty regarding the future of the town ensured that Rimbleton was a long time in building.³³ By the time the precinct was completed in the late sixties, the electronics industry had become a major employer of labour, along with considerable other light industry. The workforce demanded by these industries was more heterogeneous than that needed by mining, and many more junior white collar workers were recruited. It was also more dependent on new techniques and on technological change generally. Glenrothes Technical College was built largely in response to the needs of the electronics industry.

In South Parks, the corporation first built its large numbers of houses for sale.³⁴ During the period when council and corporation houses were sold, an additional pepper potting of owner occupiers took place throughout the town, although they remained in a minority in all precincts.

After Rimbleton and South Parks were begun, each new precinct was populated by progressively higher proportions of residents in higher social classes thus leading to Pitteuchar having over 21% of householders in social class I.³⁵ Other than this trend little differentiates the precincts built since 1960 in social terms, except that the later precincts tend to have higher proportions of flats. In the three middle precincts, less than 10% of all dwellings are

of stair access, whereas this exceeds 20% in some of the later precincts, about the same level as in Auchmuty.³⁶

Whilst the greater degree of stratification in the earlier precincts can be explained by the economic circumstances which prevailed at the time of their Constellation, no such explanation can be offered for the similar circumstances prevailing within the later precincts.

4. Conclusions

No distinct relationships were established between attainment criteria and any number of school characteristics. There was great difficulty in finding characteristics which could discriminate between schools in this fashion. Also no major advantages were found amongst the Glenrothes' schools in comparison to those of the Constellation. Such inconclusive evidence did not support the hypothesis that the particular characteristics of Glenrothes' Schools accounted for much of the advantage of Glenrothes' children on attainment tests.³⁷

The revealed differences between the precincts do however shed light upon the social structure of the town and its social development. Educational attainment was significantly correlated with social work involvement in the neighbourhood, and with certain other indicators of social structure but not with either the age of the precinct or the school. The Sixth Hypothesis could not therefore be fully corroborated.

The various indicators of social structure, correlated with attainment such as the percentage of householders of certain social classes, car ownership the incidence of one parent families and social work involvement were themselves highly intercorrelated.

However the precincts with consistently the highest scores were not those with the highest indices on the criterion of social class, they were in the middle of this scale. These precincts also held a middle position with regard to age.

These precincts were all completed between five and ten years before this research project was carried out and so occupy a similar position with regard to attainment amongst the precincts as do that group of children with higher attainment scores resident between five and ten years amongst the sample. As figures 11.4 and 11.5 show, educational attainment tends to increase with the age of the precinct until around 1960, when a construction of South Parks commenced.

This trend with regard to the relationship between educational attainment and the age of the precinct indicates a sharp break around 1960, after Woodside and Auchmuty had been completed, and when the towns employment base was being radically altered from coalmining to electronics.

This evidence lends support to the explanation offered in Chapter Ten which linked the lower test scores of the children of families resident ten or more years (compared to those resident between five and ten years) to the different social and cultural background from which they came.³⁸ However it does not invalidate the second explanation offered that the effect of any improved environment will be greatest in the first years in that environment, and that after a certain length of time, further gain in educational attainment, through remaining in the environment will be small.³⁹ These two effects may therefore complement one another.⁴⁰

The results shown in this Chapter have partially clarified the explanations put forward in Chapter Ten about the relationship of

attainment to length of residence in the New Town. However, they have also indicated a geographical dimension to the educational and social stratification of the town. Certain precincts were consistently associated with pupils of high educational attainment, e.g. South Parks, and some with lower levels of attainment, e.g. Auchmuty. These differences were related to other variables, such as social work involvement and level of car ownership, which were significantly intercorrelated themselves. The process of social differentiation had occurred in Glenrothes and some of the precincts were not socially balanced in the manner hoped for in the Reith Report. However the social differentiation which had occurred was not extreme, in the sense that obvious one-class estates had arisen on the Becontree model. Differences between precincts and schools combined accounted for no more than 11.8% of the average total variance in educational attainment. This figure compares with one of 17% of total variance on educational attainment variables accounted for by school characteristics alone in Plowden's National Survey.⁴¹ However, the New Town was only 25 years old at the time of this research and such differentiation may become more apparent with time.

Educational attainment was stratified by precinct, but although certain relationships to social structure and age of the precincts did exist, they were neither simple, nor did they indicate extreme differences between the precincts.

Notes

1. Five children from Rimbleton attended Cashieberran Primary School.
see Chapter Four pp. 87-88.
2. Pearson, Kendall and Spearman techniques were used.
3. See Chapter Two. pp.55-57.
4. Given in Appendix I. pp.251-252.
5. A total of 2725 pupils were involved.
6. For differences in the techniques of correlation,
see Appendix V. pp.311-314.
7. See Appendix II p.274 and Chapter Eight pp. 156-157.
8. This was so in spite of the larger size of the Glenrothes Schools
9. Chapter Two pp. 50-52.
10. See Chapter Four. pp.94-95.
11. See Chapter Four. pp.79-80 and 90-92.
12. Cf. table 11.1.
13. Cf. table 11.1.
14. No evaluation of teaching competence was attempted.
15. Chapter Two. pp.52-53.
16. These are given in Appendix I. pp.253-254.
17. See figures 11.4 and 11.5.
18. See table 4.2. p.36.
19. See Chapter Four pp.85-90.
20. See Chapter Two pp.50-52 and 55. In Wiseman's 1964 survey, 44 schools
were examined of which 28 were one class entry.
21. Wiseman. op.cit. 1967. p.365.
22. See Chapter Nine, p.174 Chapter Ten, p.188 and
Chapter Eight pp.144-145.
23. Chapter Eight. pp.160-161.
24. Chapter Ten. p. 182.

25. Chapter Ten. p.190.
26. Chapter Eight. pp.160-161.
27. See Chapter Four. pp.89-90. and table 4.2.
28. See Chapter Four. pp.89 - 90.
29. See Chapter Four. pp.82-83.
30. J.Klein. op.cit. and N.Dennis etal. op.cit.
31. Chapter Four. p. 83.
32. Chapter One p.16.
33. 1958 to 1967, longer than anyother precinct.
34. These houses were considerably smaller and cheaper than those of Braid Drive or Alburne Park.
35. Glenrothes D.C. Statistical Data 1972.
36. Chapter Four, Table 4.2
37. Chapter Ten. p. 192.
38. Chapter Ten.p. 192.
39. Chapter Ten. p. 192.
40. Chapter Ten. p. 193.
41. Op.cit. p. 208.

Chapter Twelve

Summary and Conclusions

In investigating the hypotheses, much material has been brought to light and, hopefully, evaluated in a useful way. It is now necessary to relate these findings and conclusions to the body of knowledge from which the six hypotheses¹ were derived.

Those who campaigned for the construction of New Towns desired to create a better quality of life for their inhabitants, than the inner-city areas and industrial villages, which had previously housed their populations. The writings of Owen, Howard, Osborn and Shaffer, all reveal this aim. Also implicit within the ideology of the New Town movement was the belief that not only should life in a New Town be better because of better standards of housing, education, health and etc., but also because of a more even distribution of the benefits of these amenities throughout the town's population.²

These ideas were grafted on to the core of the movement which gave rise to the New Towns after 1945. They had distinct egalitarian implications. Ebenezer Howard had stressed 'special regard to the quality of building design' for even the 'lowliest dwellings and 'initiatives in co-operative enterprises' amongst his "Unique Combination of Proposals."³ Gilbert McAllister, an organiser of public activities for the Town and County Planning Association, and a parliamentary supporter of the 1945 to '50 government which enacted the proposals wrote; "the only way to a nation of men, women and children as fit as possible, as intelligent as possible and as morally sound as possible is through the creation of the right environment".⁴ He expected New Towns to play a great part in the creation of this environment.

These statements, and similar ones by other protagonists,⁵ gave the New Towns a significant part to play in the building of the

Welfare State, as it was conceived in the years 1945 to '50. The New Towns Act was passed in 1946 and should be classed amongst the socially redistributive legislation of that period, which included the creation of the National Health Service, a national social security system and the foundation of local authority personal social services.⁶ The actual redistribution effect of much of the legislation of that period has since been questioned.⁷ An evaluation of the New Towns Policy should include this yardstick.

An often quoted analogy when referring to the distribution of wealth in the United Kingdom has been the characteristics of cake, namely its overall size and the relative sizes of particular slices of that cake. The analogy can be used to illustrate concepts other than wealth. This research has, to a large degree, involved the investigation of the size of the education 'cake' in a New Town, and also of the sizes of the different slices.

Hypothesis One: "The level of attainment of children in a New Town will be higher than that of a socio-economically comparable population."

This hypothesis dealt with the size of the cake. Frank Shaffer's assertion that 'the education standards in New Towns are high'⁸ was confirmed and the above hypothesis corroborated. The New Town Children had distinct and significant advantage over the children of the Constellation on the attainment tests which was not the result of social class differences.⁹

However this did not appear to be related directly to the physical environment of the town, at least when the standards of the homes themselves were compared. Nor did the New Town children have any advantages over the children in the Constellation in the occupations

of their parents, the type of house they lived in, or the amenities within the house, and their parents were less likely to own the dwelling.¹⁰ In comparison to the New Town, the population of Constellation can not in any way be considered materially 'deprived'. Although the residents of the New Town enjoy housing amenities which are above the national average, those who live in the surrounding area are not far behind.¹¹

The National Survey of 1964 indicated that only 9% of the total variance in attainment between pupils was accounted for by variations in home circumstances. This was only a half of that accounted for by variations in parental attitudes,¹² and the Plowden Report estimated that 'only about a quarter of the variation in parental attitudes is conditioned by the variation in home circumstances'.¹³ An examination of parental attitudes and behaviour in the two areas did reveal a considerable difference between the two populations. Of the eight attitudes and activities significantly related to attainment,¹⁴ all of them indicated an advantage to Glenrothes children, e.g. their parents were more likely to be members of a library, to visit the school a reasonable number of times,¹⁵ and to help with schoolwork.

All the surveys conducted for the Plowden Report¹⁶ showed that such advantages in background were associated with higher attainment. A major aim of the Educational Priority Areas was to achieve a shift in these attitudes through the interaction of parents and teachers in community schools.¹⁷

The New Town schools themselves showed no great differences from those of the Constellation, other than that they were newer and bigger, neither of which was related to attainment in a statistically significant manner. In general the schools differentiated themselves from one

another in no distinctive manner, when judged by the attainment of their children. No significant difference was found between the areas in terms of the organisation and material circumstances of their schools.¹⁸ Similarly no great difference was found in the degree¹ involvement of the Social Work Department in the two areas.¹⁹

The variations in circumstances between the two areas accounted for an average of some 11.3% of the total variance in attainment scores.²⁰ Thus indicating the magnitude of the differences in scores between the two areas, which amounted to about one third of a standard deviation on the attainment criteria.²¹ This difference was significant and the only variables also found to differ significantly between the areas were those concerning parental attitudes and behaviour.²² These differences in parental attitudes and activities are held to account for much of the advantages in attainment of the New Town children, as they have well established causal links with educational attainment, as was demonstrated in Chapter Two.

Hypothesis Two: "Differences in the level of educational attainment between classes will be smaller in the New Town than in a comparable population."

Children from the New Town had scores which were, on average, higher than those of children from the Constellation for all but one of the social classes,²³ this was social class one, higher executive and professional workers. This class is the most advantaged in educational terms,²⁴ and a further advantage gained from living in a town, designed to improve the lot of those lower down the social scale, was not expected. The advantages of the children in all the other social classes indicated that the 'cake' was being cut into different sized 'slices' in the New Town compared to the Constellation.

Average differences in attainment of all social classes from that of social class I were half the size in Glenrothes, compared to the Constellation and the variance in attainment accounted for by social class was similarly less in the New Town.²⁵

The second hypothesis was therefore corroborated. The results also indicated that the importance of social class as an indicator of attainment was much less in Glenrothes. This had considerable implications with regard to the stratification of attainment in the two areas. The social class of a child is a good indicator of that child's attainment, not only because of the transmitted effects of his or her father's work and income, but as Holly put it "because an individual is born into a coherent and pervasive system of values attaching to a given social position,"²⁶ and also because income to a large degree determines housing standards, material background and the neighbourhood occupied.²⁷ That the importance of social class as an indicator of attainment was less great in Glenrothes, implied that there was some breakdown of the 'coherent and pervasive system of values associated with social class in the New Town, and that the linkage of occupation to income, housing and neighbourhood was less strong.

Whilst no significant differences were noted between the variations of particular circumstance, attitudes or activities, between the two areas, many of them were less strongly linked to attainment in the New Town. The relationships of home circumstances, parental education, parental attitudes and behaviour and family structure,²⁸ to educational attainment were less strong in the New Town. Frequently less than half the variance in attainment accounted for by these characteristics in the Constellation was noted amongst the New Town

population. On such varied activities and attributes as; expected school leaving age, frequency of parental schoolvisiting, maternal occupation, frequency of family outings and family size there was a lower degree of association for the Glenrothes' children with both attainment and social class.²⁹ Of the 18 indicators significantly related to attainment, amongst the New Town sample, 15 demonstrated a weaker relationship with educational attainment.³⁰ Similarly of 32 indicators significantly related to social class, there was a stronger association for the Constellation on all but four of them.³¹

When other methods of stratification were used,³² smaller associations with other indicators were likewise found amongst the Glenrothes' population. It was therefore necessary to conclude that the New Town's population was less rigidly stratified than that of the Constellation. Whilst in both areas, children of families with favoured characteristics tended to perform better on the test, and such characteristics as house type, tenure and amenities were linked to occupational criteria and to attitudes and patterns of behaviour, the strength of the associations amongst the New Town population was distinctly less.

The research findings indicate that the differences in the patterns of attitudes and behaviour between social groups were smaller in the New Town, and that there was less congruence between different methods of stratification. The major beneficiaries in educational terms of this less rigid stratification were those children at the bottom of the social scale (especially as this was linked to higher overall performance in the town). In the New Town the education 'cake' has been cut in a somewhat different way from the Constellation.

Although the least favoured children in the New Town still got the smallest 'slice' it was relatively larger than that got by the least favoured in the Constellation.

Hypothesis Three: "The different reasons given for moving to a New Town will indicate differences of attitudes and behaviour and hence attainment amongst the children of those moving".

This hypothesis was introduced in order to determine whether the incoming population to the New Town possessed any special characteristics, which differentiated them from the comparison population.

The new industries which are to be found in New Towns tend to have relatively few unskilled jobs and this has led to an under-representation of unskilled and semi-skilled workers. Heraud has claimed that New Towns have been populated by 'industrial labour selection'.³³ This is obviously the case with regard to industrial transfer schemes. However such schemes as the Industrial Selection Scheme have contributed only a small proportion of workers to the New Towns. However, Heraud's claim is further justified, in a less direct way, by various corporation's housing policies, which involve letting houses primarily to those who can get jobs in the town.

In this way, New Town residents do not correspond to a typical cross section of British Society, although the social structure of the New Towns is relatively close to that of Great Britain in terms of social classes.³⁴ Those who move to a New Town choose to do so, and this choice differentiates them from the rest of the population. Those who moved to Glenrothes did so far a significantly different distribution of reasons than those who moved to or within the Constellation. In the latter case, as far as those moving within the

New Town itself, most replied that had moved for 'a better house', and most of the remainder specified 'other reasons'. The reasons given by those whose last move had been to the New Town, were quite different, 'a better job' or 'a better environment' accounted for over half their ³⁵ reasons for moving.

There was also a class differential in the reasons given for moving to the New Town. The most frequently given reason by manual workers was that of 'a better house' followed in frequency by that of 'a better environment'. The position of white collar workers was the reverse of this, in that the most frequently given reasons were 'a better job' and 'other reasons'. The importance of job aspiration in middle class values together with the career structures associated with white collar work differentiated the white collar workers from the manual workers whose traditional spur for moving has been poor housing and environmental deprivation, and must effect the reasons of the groups for moving towns.³⁶

Children of families who had last moved house for 'a better job' had significantly higher average test scores. This was not primarily the result of social class differences. Those who had moved to Glenrothes for this reason differed markedly from the rest of the sample on many of the other indicators. These differences were most noticeable on those variables known to be associated with educational advantage. The parents tended to have left school later, have better home amenities, visit libraries more frequently and help the child more frequently with schoolwork. They also had the highest expectation of school leaving age for their children. Differences amongst the rest of the sample on these variables were not consistent and rarely significant.³⁷

Differences in reasons given for moving to the New Town were associated with differences of attitudes and behaviour and differences in the children's attainment. The third hypothesis was therefore corroborated. The confirmation of the association of the most frequently given reason for moving to Glenrothes (and least frequently given one by the Constellation sample) with parental attributes associated with higher attainment implies that the nature of the populations in the two areas may have been different in educational terms as a result of the New Town is recruiting a population with better educational endowments. Hawthorne has demonstrated a link between parental job aspiration and children's attainments.³⁸ The work of Gordon, the Newson's and Toomey have also shown an association of parental aspirations for a better life with one for their children.³⁹ The National Survey indicated that the level of parental aspiration was one of the most important two determinants of a child's educational attainment.⁴⁰

It does appear that when the immigrants to Glenrothes decided to move to the New Town they had (although they had the same socio-economic characteristics) more favourable attributes in educational terms than the residents of the Constellation.

An analysis of variance revealed that the reasons given for moving accounted for about 6% of the variance in attainment, and upwards of third of the advantages in attainment of the New Town children over their Constellation counterparts.⁴¹

However, those who moved to Glenrothes for reasons not associated with educational advantage also had children with significantly higher scores than the Constellation sample, and hence render other explanations of the advantages of the New Town children necessary. One

reason often quoted for the lower aspirations of those in lower occupational groups is that "Horizons are limited by lack of knowledge, and job choices are frequently made within a frame of reference that is only wide enough to include those types of employment pursued by members of their families, relatives or friends in the neighbourhood."⁴² The less rigid stratification of the New Town should have had some effect upon those horizons, as indeed should the move between towns, from one environment to another.

Hypothesis Four: "Within similar social and economic circumstances, educational attainment will correlate with length of stay in the New Town."

The data indicated that attainment correlated with length of stay up to a period between seven and ten years, but not beyond that time. Two sources of information were used; length of education, with a maximum span of seven years, and length of residence gained from questionnaire returns. As far as the time span of education went, the two sources agreed upon a small but significant correlation, however when a period longer than this was considered length of residence indicated a drop in attainment. Three possible explanations can be put forward. The first involves the schools in the town as being the prime transmitter of educational advantages over other areas, but this is unlikely because of the absence of any definite evidence regarding associations between school characteristics and attainment.⁴³ The second centres on the change in the industrial base of the town after the failure of the Rothes Colliery, and hence the change in the structure of the population of the town. The analysis of precinct differences revealed that the middle three precincts (in terms of age) have attainment records higher than either the older or the newer areas,

providing a profile of attainment with children from precincts completed between six and ten years having higher scores than other children from both older and newer precincts.⁴⁴ These precincts were built largely after the closure of the Rothes Pit. A reformulation of the hypothesis to take account of the changed social and economic circumstances due to industrial restructuring in the development of the town was necessary to explain the results.

The third possible explanation does not necessarily conflict with either of the above, but may be complementary to them. This explanation is based on the work of Klineberg and Lee who noted that improvements in the intelligence quotients of Southern Blacks moving to the more stimulating environments of the Northern Cities of the U.S.A. were most marked in the first years after moving and ceased to be noticeable after five or so years residence.⁴⁵ The results from Glenrothes are in line with these findings showing improvements in attainment up to six years residence.

The effect of length of stay in the New Town was small, accounting for no more than $3\frac{1}{2}\%$ of the total variance in verbal reasoning,⁴⁶ and its relationship to educational attainment was not linear, at least beyond seven years residence, but it was significantly associated with educational attainment for periods up to seven years, which is the period for the greatest educational effect of a New Environment.

Hypothesis Five: "The longer the residents have been in the Town, the smaller the differences in attainment between classes will be."

The situation noted in hypothesis four was replicated in that class differences were noted to have decreased up to that period from seven to ten years, where after they increased again. The inconsistencies in both these relationships were similar. When length of

education was considered, the decrease in class differences with length of residence was consistent with the hypothesis. This evidence was not contradicted by data on length of residence until a period of ten or more years residence was considered, when class differences widened. The hypothesis could not, therefore, be corroborated, but required modification in line with that for the Fourth Hypothesis. Differences in educational attainment between social classes did decrease with length of stay in the New Town up to ten years residence, in the relatively stable conditions of economic expansion then prevailing in the New Town.

Hypothesis Six: "Educational attainment will be positively linked to both the social structure and the age of the precinct."

In assessing this hypothesis, segregated scores of pupils attainment in the local schools over the previous five years were correlated with information gained upon various indices of social structure and social activity for the New Town. Of the dozen indicators which rendered significant correlations, two groups could be identified, those concerning 'social malaise', e.g. caseload of social work department, and incidences of breaking and entering the schools themselves, and those concerned with socio-economic structure, e.g. percentage of social class V and extent of car ownership. The two types of indicator were highly correlated themselves,⁴⁷ thus indicating that the precincts within Glenrothes were stratified in a similar order no matter whether indicators of educational attainment, socio-economic structure or social malaise were taken. This correlation analysis revealed significant correlations between social structure and attainment for the precincts of the New Town. However no significant relationship of the same type could be ascertained between attainment and the

age of precincts. Hypothesis six therefore could not be fully corroborated.

However, differences between precincts accounted for between eleven and twelve percent of the total variance in attainment, a figure as large as that between the New Town and the Constellation. The social stratification of the town resulted in a significant geographical variation in attainment. This was associated with stratification on numerous other social indicators and demonstrated that a considerable social differentiation existed within the town, to such a degree that advantaged and disadvantaged areas could be identified. Auchmuty was at the bottom of almost every scale, but it was not so easy to make out the most advantaged area in social terms. South Parks had the highest proportion of owner occupiers and the highest rank order of educational attainment, Pitteuchar, the highest proportion of white collar workers and the lowest proportion of flats, and Newcastle the highest proportion of professional and executive workers.

The social differences within the town can be explained to a large degree by considering its industrial and economic development.⁴⁸ In the early days, Glenrothes was dependent for its economic development on the National Coal Board, and the Rothes Pit in particular. In 1960 the demise of the Rothes Colliery was foreseen and moves were undertaken to alter the town's employment base. These moves led to the introduction of electronics, one of the major growth industries of the 1960s. Since that time electronics and other light industry has remained the base of the development of Glenrothes.

This change in economic base had results in the social sphere, similar to those found in Crawley by Heraud,⁴⁹ but probably more dramatic. Mining in the early 1950s required a large number of manual workers, with a relatively small service back up. The Development

Corporation provided a large number of houses for rent in Woodside and Auchmuty, and a much smaller and physically segregated area of executive dwellings. The traditional social structure of mining communities was reflected in the activities of the population, Glenrothes had its own 'Festival' or 'Gala' day, an event typical of mining communities, which has now passed away, at least in that form.

The workforce demanded by the new industries was more heterogeneous and more white collar jobs were available. The proportion of white collar jobs has increased over the years and the most recently built precincts contain the highest proportions of non-manual workers. The traditions of the new immigrants brought in by these industries were different from those of the original population, because they came from different job backgrounds and from different areas.⁵⁰ The precincts built since 1960 housed most of the new immigrants. The housing in the older precincts is less attractive to newcomers, and those who can afford it move to the more modern houses in the newer precincts. House-allocation policy in attempting to match the rent of the dwelling to the income of the tenant aids this process of social differentiation.

The greater degree of stratification and the lower level of performance in the oldest areas of the town can be explained by a combination of cultural tradition and the socio-economic consequences of industrial development and housing management. However no such explanation can be offered for the similar situation prevailing within the later precincts. These were constructed whilst the electronics and light industrial base continued to expand, and they contain the highest proportion of white collar workers, a phenomenon associated with a highest level of attainment for all the children attending the local schools.⁵¹

The precincts with the highest attainment and the lowest degrees of stratification are those built in the early to mid-sixties, just after the change in employment direction. They contain far fewer white collar workers than the later precincts, yet children there performed better on the attainment tests. The profile of attainment and stratification with age rendered by the precinct analysis is similar to that noted in the pupil analysis investigating hypotheses four and five.⁵²

If the town is looked at in this historical manner, there is a case for considering the New Town as a mechanism for redistribution and improvement over time. However to do this, it is necessary to treat the New Town in only its second phase, that of an 'electronics' centre and to regard the mining town as a first phase, aborted by the closure of the Rothes Colliery. This is a large step from the original model. Yet social policies are to a considerable extent at the mercy of economic prosperity or depression. Beveridge, in the most famous of all reports concerned with Social Policy⁵³ stated that one of his three assumptions was full employment, and that of the "Five giants on the road to deconstruction", 'Idleness' had to be tackled by measures for ~~steady~~ ^{steady} and developing the economic system. In the case of Glenrothes this manifestly did not happen in the first fifteen years of the town's life.

However, the social differentiation amongst the precincts accounted for less variance in attainment than that accounted for by the social class of the individual pupils. At the time of writing geographical social differentiation was probably still proceeding in Glenrothes, but the variance in attainment accounted for by neighbourhood and school differences was smaller than any earlier research⁵⁴ has revealed.

The Determinants of Educational Attainment in Glenrothes and the Constellation

The two areas were similar in the relationships of variables to educational attainment, and most of the indicators noted in Chapter Two were significantly associated with educational attainment in both areas. As is shown in tables 12.1 and 12.2. indicators of the material background of the home (e.g. house type, tenure, age of dwelling), the education and literacy of the parents (e.g. education, frequency of library visiting), the aspiration and encouragement of the parents (e.g. school visiting), family structure (e.g. family size, disrupted family) and social class were all significantly associated with educational attainment. Other indicators of parental attitudes and activities were also significantly related to educational attainment (e.g. visited neighbours in their home, frequency of family outings). Of these variables, most can be explained by their indication of other characteristics. The frequency of family outings indicates a family centred activity and to some degree the involvement of parents with their children. Membership of organisations and visiting neighbours' homes are activities commonly associated with higher social classes.⁵⁵ Less frequent visiting of relatives is similarly associated and Toomey⁵⁶ noted a similar phenomenon with the more 'privatised' working class parents of educationally successful children. However trade union membership is most certainly not so associated, but may be indicative of skilled manual workers as opposed to the less skilled, or of increasing white collar unionism. It may also be indicative of more socially involved and committed parents, however no firm explanation for this association can be offered.

Table 12.1. Average Significant Coefficients between Variables
and Verbal Reasoning Quotients in Glenrothes and
the Constellation

	<u>Glenrothes</u>	<u>Constellation</u>
No. of rooms.	.19	.40
Education (average of all 3 variables)- Wife	.14	.23
Education (average of all 3 variables)- Husband	.17	.25
Social Class	.32	.39
Wife's Occupation	.30	.45
Frequency of family outings	.12	.26
Frequency of contact with relatives	- .10	- .10
No. of Organisations a member - Husband.	.18	.26
No. of Organisations a member - Wife.	.22	.32
Family size.	.11	.31
Birth Order.	- .10	- .26 ^a

Table 12.2 Variables Significantly Associated with Educational Attainment
and the range of scores * they covered in Glenrothes and the
Constellation

<u>Variable</u>	<u>Glenrothes</u>	<u>Constellation</u>
House type	10	11
Tenure	6	11
Central heating	4	10
Telephone	2	11
Age of dwelling	7	11
Library visiting - Husband	9	18
Library visiting - Wife.	6	13
Frequency of child's reading at home	19	17
Child's expected school leaving age	13	23
School visit by husband.	5	3
School visit without invitation - Husband	0	10
School visits up to six in number.	9	10
School visit without invitation - Wife.	- 5	- 3
Satisfaction with child's progress	8	5
Length of residence in present dwelling	4	- 9
Membership of an organisation - Wife.	3	10

	<u>Glenrothes</u>	<u>Constellation</u>
Trade Union membership - Husband	4	9
Trade Union membership - Wife	1	9
Visited neighbours in their home	2	7
Disrupted family	8	16

* The range of scores covered is average difference in verbal reasoning quotients between the two extreme points covered by the variable.
e.g. the extreme points of house type are detached house and tenement or flat, the average score of residents of detached houses in Glenrothes is 10 points higher than residents of flats.

The two areas differ on the directions of only two associations, husband visiting the school without an invitation, and length of residence in present dwelling. The former may be indicative of the greater social stratification of the Constellation, and the latter the result of more able and more mobile recent migrants to the Constellation.

School variables demonstrated only a few significant associations with educational attainment, but neighbourhood variables showed significant associations between social work involvement, social structure and educational attainment, and the relationships were similar in direction in both Glenrothes and the Constellation.

The similarity of the relationships in both areas was marked. The determinants of attainment in the New Town did not differ in kind from those of the Constellation or from those found in the research reviewed in Chapter Two. The differences lay in the structure of their interaction.

The Effect of the New Town Environment on Educational Attainment

Educational attainment for children from Glenrothes was significantly higher than that for a comparable group of children from the surrounding area. The differences in educational attainment between children from different social classes were smaller in the New Town than in the Constellation. These findings lend support to the claims of the

proponents of New Towns that they would provide an environment for an improved quality of life, and also to the aims of the legislators of the late 1940s in the redistribution of life chances and creating a more egalitarian society.

However the migration of parents to Glenrothes, with more favourable attitudes to education accounted for a considerable part of the advantage of the New Town's children in educational attainment, but not all of it. Breaks in the patterns of migration have been occasioned by the changing needs of local industry and these have had considerable effects upon the social structure of the town. The movement towards equality and improvement was most hampered by the changing economic conditions, and emphasises the need for a stable economic basis for the success of social policies.

Despite these economic difficulties, Glenrothes New Town has expanded to fulfil its first population target and to provide the major growth point for the Region of Fife. In this time of steady growth there is evidence that the longer children spent in the environment of New Town, the more the educational attainment improved, and after 25 years of existence the stratification of the New Town population in both educational and other respects was considerably less than that of the Constellation.

In 1941 the McAllisters wrote "There is nevertheless, not sufficient recognition that the only way to a nation of men, women and children as fit as possible, as intelligent as possible and as morally sound as possible is through the creation of the right environment, and there are moreover, some simple, if dramatic steps which the community as a whole might take which would result in a tremendous advance towards this ideal.⁵⁷ This ideal is still a long way off, but if the evidence from Glenrothes

is representative of New Towns in general, they are one step along the road to that environment.

Notes

1. Chapter Three pp.72-73.
2. Chapter One pp.2-4.
3. Howard, op.cit. pp.118-127.
4. McAllister G. E. op.cit. p.1.
5. e.g. Osborn, F.J. 'New Towns after the War' London 1918 and 1942.
6. The National Health Service Act of 1946 came into operation on 5th July 1948, The National Insurance Act of 1946 was followed by the National Assistance Act of 1948, which completely repealed the 'Poor Law', placing the financial aspects of the old Poor Law in the hands of the National Administration and instructing local authorities to make 'further provision for the welfare of the disabled, sick, aged and other persons' (p.50), thus providing the basis for the present day personal social services. The 1948 Children's Act also gave local authorities certain statutory duties in terms of the welfare of children. The Legal Aid and Advice Act has passed in 1949 and the Town and Country Planning Act of 1947 reformed planning on a national basis.
7. See for example 'Labour and Inequality' Peter Townsend & Nicholas Basanquet (eds) Fabian Society 1972, Titmus, R.M. 'Commitment to Welfare' Unwin 1968 and for a more radical critique, see Kincaid.
8. Schaffer, F. op.cit. p.131.
9. See Chapter Seven p132.
10. See Chapter Seven pp133-136.
11. Social Trends of 1974 reported 3.7 million substandard homes in the U.K., some 50 of these were in the Glenrothes District (Census 1971), less than one hundredth of the proportion in the U.K. nationally. It should, however, be noted that the response rate in the Constellation was lower, and it is therefore likely that the results from this area indicated a higher level of provision than existed.
12. The National Survey of 1964 op.cit. p.200 table 3.B.
13. Plowden Report, op.cit. vol.II. p.189.
14. Chapter Seven pp.134-135

15. See Appendix II and Appendix III.
16. Wiseman on the Manchester Survey also noted the association of paternal involvement with brightness (op.cit.p.377 para 94)an association also noted in Chapter Seven. p.382 para 110)
17. Anna Corbett, summarised the brief for the E.P.A. project under four headings.
 - (i) Raising the educational performances of primary school children.
 - (ii) Improving the morale of the teachers.
 - (iii)Increasing the involvement of the parents in education
 - (iv)Increasing a sense of community responsibility.'The E.P.As. judged' New Society 5.10.'72.
18. Only two solely school characteristics had consistent relationships with attainment, ease of taking books home, and number of extra-curricula activities, only on the latter point did the Glenrothes schools demonstrate any advantage. Chapter Eleven, pp.200-201.
19. The Social Work Area Office had the lowest caseload per head of population for all the region.
20. Chapter Eleven. table 11.7.
21. A third of a standard deviation one-way from the mean, would cover about 15% of the children tested, thus whereas 50% of the children in the Constellation scored above a V.R.Q. of 100, 65% of the children in Glenrothes would do so.
22. Chapter Seven, table 7.4
23. Chapter Eight, tables 8.1 and 8.2
24. See Chapter Two. pp.48-49.
25. Chapter Eight, tables 8.1 and 8.3
26. D.Holly, 'Society Schools and Humanity' ,op.cit..
27. See Chapter Two.pp.43-49 and 'Some Sociological Comments on Plowden' Basil Bernstein and Brian Davies, in 'Perspective on Plowden'. R.S. Peters (ed). Routledge and Kegan Paul 1969.
28. Chapter Eight pp.154-160.
29. Chapter Eight pp.156-159.

30. Chapter Eight p.157.
31. Chapter Eight p.160, Appendix 4.
32. Chapter Eight pp.154-160.
33. Heraud, B.J. 'Social Class and the New Towns' Urban Studies. Feb.1963.
34. See Chapter One pp.8-11. and Schaffer op.cit.p.186.
35. Chapter Nine, table 9.1.
36. Chapter Nine, p.168. Willmott (1963), Young and Willmott(1957), Willmott and Young (1960) and Klein(1965) give general expositions of such class differences.
37. Appendix IV. pp.304-305.
38. Hawthorne 'A Sociological Portrait of family background' New Society. 4.11.71. see also Musgrove, F. 'The family, education and society' 1966. esp. ch.5.
39. Douvan, E. and Adelson, J. (1958), 'The Psycho-dynamics of Social Mobility in Adolescent Boys', J.Abnorm.Psych. LVI. Newson, J & E., 'Patterns of Infant Care in an Urban Community' Penguin. Toomey. op.cit.
40. The National Survey (op.cit.) pg.186. Fig.11.
41. Chapter Nine, 174. It should be noted that the variance accounted for by differences between the New Town and the Constellation was just less than 12% of total, i.e. about twice that accounted for by differences between reasons in the New Town.
42. Holly, 'Society, Schools and Humanity' op.cit..
43. See Chapter Eleven. pp.199-201.
44. See Chapter Eleven, table 11.4.
45. See Chapter Ten. p.192.
46. See Chapter Ten. p.188.
47. Chapter Eleven, table 11.3.
48. See Chapter Four, pp.78-85.
49. Heraud B.J. 'Social Class and the New Towns' op.cit.
50. Most the 'fifties' immigrants were miners from West Pife, and some from Lanarkshire, those of the sixties' came from a more varied set of backgrounds.

- 51. See Chapter Two. pp.50-52. and note 84.
- 52. See Chapter Eleven, table 11.4. and Chapter Ten, table 10.2.
- 53. Report of the Committee on Social Insurance and Allied Services
Cmd.6404. HMSO.1942.
- 54. See Chapter Eleven. p.208.
- 55. See J.Klein. (op.cit.)
- 56. Toomey (op.cit)
- 57. McAllister (op.cit.) p.1.

Appendix I

The data and its sources

1.1. Information upon each child gained from School Records

1. Scottish Education Department Card

Scores on attainment and intelligence tests taken.

Sex.

Date of Birth.

Date of Commencement of Primary Education.

Dates of entry and exit from all previous schools.

Father's occupation and workplace.

Mother's workplace (occupation not specified, but sometimes given).

Name of parent or guardian.

Family size.

Birth Order.

2. From Other School Records

Attendance at a nursery school

Attendance at this school

Composition of Class

Meals taken, whether free or not.

I.2. Covering Letter Sent Out With The Questionnaire

Department of Social Administration,
George Square ,
Edinburgh.

10.6.'74.

Dear Parent,

I should like to ask for your co-operation in a research project, which I am conducting under the auspices of the Department of Social Administration at the University of Edinburgh. It deals with education in your neighbourhood : how the area and its schools satisfy the needs of the people who live there. The only way I can do this is by asking parents to answer a number of questions. Your co-operation is therefore vital. If you can give me this by filling in the questionnaire , I hope to be able to draw some generally useful conclusions.

I would emphasise that any information that you give me will be treated entirely confidentially. I am the only person who will see this information and no names will be passed on by me to anyone.

The Fife Education Authority and the headteacher of your child's school have given me permission to ask for your co-operation, although they will not see the information that you give me.

The questionnaire is set out in such a way as to enable you to fill it in yourself within 15 minutes. I will be most grateful if you can return the questionnaire to your child's school by the 19th of June .I thank you for your co-operation.

Yours faithfully,

C.A. James B.Sc. Dip.S.A.

The questionnaire is set out overleaf .

EDUCATION AND THE NEIGHBOURHOOD

Would you please answer the following questions, and return the form to me, sealed in the envelope provided, via your child's primary school.

- 1.(i) In which of the following types of dwelling do you live ?
(PLEASE TICK ONLY ONE BOX)
- Detached house
 - Semi-detached house
 - Terraced house
 - Maisonette
 - Flat
 - Tenement
 - Other type
 - (Please specify:.....)
- (ii) Do you own your own dwelling ,or is it rented ,or are you ledgers ?
(PLEASE TICK ONLY ONE BOX)
- (iii) How many rooms are there in your dwelling? Please include the kitchen but not the bathroom or toilet.(PLEASE TICK ONLY ONE BOX)
- 2 3 4 5 6 7 8 or more
- (iv) How many people normally live in your dwelling ?
(PLEASE STATE THE NUMBER)
- (v) Which of the following amenities do you possess ?
(PLEASE TICK ALL THOSE THAT YOU HAVE)
- An indoor toilet
 - A bath or shower
 - Hot and cold running water
 - Central heating
 - A telephone
 - A yard or garden which can be used as a playspace
- (vi) How old is the dwelling ? Was it built before
- 1919
 - before 1944
 - before 1960
 - 1960 and after
- 2.(i) At what ages did you leave school? Husband Wife
(PLEASE TICK ONE BOX EACH)
- 14
 - 15
 - 16
 - 17
 - 18
 - 19
- (ii) Did either of you attend any of the following institutions or courses?
(PLEASE TICK ALL THOSE THAT ARE APPROPRIATE) Husband Wife
- Senior secondary or grammar school
 - An apprenticeship
 - A central institution
 - A technical, art or commercial college
 - University, including the Open University
 - The Open University
 - Evening classes for a further qualification
 - Leisure classes
 - A correspondence course
 - Any other form of further education
 - (Please specify.)

3.(i) Are either of you members of a library? Husband Wife
 (PLEASE TICK ONE BOX EACH) Yes
 No

If so, how frequently do you visit it?

Every week
 Every two weeks
 Every month
 Less frequently

(ii) Does your child do any reading at home? Yes No

Not counting comics, how often does he or she read?

Usually every day
 2 or 3 times a week
 Less frequently than this

4.(i) Is either of you widowed, separated or divorced? Yes No

(ii) Is either of you disabled? Husband Wife
 (PLEASE TICK ONE BOX EACH) Yes
 No

If so, could you please specify how.)

5. Until what age do you expect your child to remain at school? 16
 17
 18
 don't know

6.(i) How many times have you visited the school in the last twelve months? Husband Wife
 (PLEASE TICK ONE BOX EACH)

Not at all
 Once
 Twice
 Three times
 4/6 times
 More than this

(ii) Have either of you gone to see your child's teacher or headteacher without an invitation? (PLEASE TICK ONE BOX EACH) Husband Wife
 Yes
 No

(iii) Do you help your child with his or her schoolwork? Husband Wife
 (PLEASE TICK ONE BOX EACH) Yes
 No

If you do, about how often do you give this help?

Every day
 2/3 times a week
 Every week
 Less frequently

(iv) Have you bought any school textbooks for your child? Yes No

(v) Are you content with your child's progress at school? Yes No

If you are not satisfied could you please state why:

.

(vi) Are you satisfied with the school itself? Yes No
 If you are not satisfied could you please state why:

.

Husband.
Wife

(ii) How long have you lived in the locality, i.e. the town or village?
(PLEASE TICK ONE BOX ONLY)

<input type="checkbox"/>	Less than one year
<input type="checkbox"/>	Less than 2 years
<input type="checkbox"/>	Less than 5 years
<input type="checkbox"/>	Less than 10 years
<input type="checkbox"/>	Longer than this

(Please specify)

Yes No

If so could you state whether the last one was less than 3 weeks
(PLEASE TICK ONE BOX ONLY) ago
or after Easter
or before Easter?

(v) How often do you see your relatives, i.e. parents, brothers & sisters?
(PLEASE TICK ONE BOX ONLY)

Every day
More than twice a week
Every week
Every month
Less frequently than this

(vi) Do you belong to any club or organisation, including a trade union?
(TICK ONE BOX EACH, PLEASE) Husband Wife

Yes
No

If so could you please list them below:

Husband	Wife
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

(vii) Do you spend most of your spare time inside or outside the home?
 (PLEASE TICK ONE BOX ONLY)

	Inside	Outside
--	--------	---------

(viii) What contact do you have with your neighbours?
(PLEASE TICK ALL THOSE THAT ARE APPROPRIATE)

- 247 -

9. Could you list all those in your dwelling with their age and relation to yourself. Please include yourself at the top of the list.
(E.g. Self 42, Spouse 40, Son 12, Lodger 23.)

10. If you have any comments that you would like to make on the questionnaire or on any of the questions, e.g. being unable to understand one of them, could you do so below.

Date .

Name .

Address .

The Information used for each pupil

<u>Characteristic</u>	<u>Source</u>
1. School attended	School
2. Sex	Record Card
3. Date of Birth	Record Card
4. Term of entry into present school	Record Card
5. Term of entry into a school in Glenrothes	Record Card
6. Term of commencement of primary education	Record Card
7. Number of schools attended	Record Card
8. Nursery Education	School
9. Picture Intelligence Score '69	Education Department
10. Picture Intelligence Score '70	Education Department
11. Reading Score '69	Education Department
12. Reading Score '70	Education Department
13. Mathematics Score '69	Education Department
14. Mathematics Score '70	Education Department
15. Verbal Reasoning Quotient '73	Education Department
16. Verbal Reasoning Quotient '74	Education Department
17. Absence in last 12 months	School
18. Time spent in mixed age classes	School
19. Meals taken	School
20. Free meals taken	School
21. Type of house	Question 1(i)
22. Tenure on house	Question 1(ii)
23. No.of rooms in the house	Question 1(iii)
24. No. of residents in the house	Question 1(iv)
25. Possession of basic amenities	Question 1(v)
26. Possession of central heating	Question 1(v)
27. Possession of a telephone	Question 1(v)
28. Possession of a yard or garden which could be used as a playspace.	Question 1(v)
29. Age of the dwelling	Question 1(vi)
30. School leaving age : husband	Question 2(i)
31. School leaving age : wife	Question 2(i)
32. Level of education : husband	Question 2(ii)
33. Level of education : wife	Question 2(ii)
34. No.of educational courses taken : husband	Question 2(ii)

35. No.of educational courses taken : wife	Question 2(ii)
36. Library membership and) husband Frequency of visiting a library)	Question 3(i) Question 3(i)
37. Library membership and) wife Frequency of visiting a library)	Question 3(i) Question 3(i)
38. Frequency of child's reading at home	Question 3(ii)
39. Disabled husband	Question 4(ii)
40. Disabled wife.	Question 4(ii)
41. Expected school leaving age of the child	Question 5
42. No.of schoolvisits in past year : husband	Question 6(i)
43. No.of schoolvisits in past year : wife	Question 6(i)
44. A visit to the school without an invitation husband	Question 6(ii)
45. A visit to the school without an invitation wife	Question 6(ii)
46. Paternal help with the schoolwork	Question 6(iii)
47. Maternal help with the schoolwork	Question 6(iii)
48. Textbooks bought	Question 6(iv)
49. Satisfaction with child's progress at school	Question 6(v)
50. Satisfaction with the school	Question 6(vi)
51. Work status : husband	Question 7
52. Work status : wife	Question 7
53. Social Class	Question 7 and record card
54. Wife's occupation	Question 7 and record card
55. Length of residence in present dwelling	Question 8(i)
56. Length of residence in present locality	Question 8(ii)
57. Reason given for last move	Question 8(iii)
58. Frequency of family outings	Question 8(iv)
59. Frequency of contact with relatives.	Question 8(v)
60. Membership of an organisation : husband	Question 8(vi)
61. Membership of an organisation : wife	Question 8(vi)
62. No.of organisations joined : husband	Question 8(vi)
63. No.of organisations joined : wife.	Question 8(vi)
64. Membership of a trade union : husband	Question 8(vi)
65. Membership of a trade union : wife	Question 8(vi)
66. Main locus of leisure activity	Question 8(vii)
67. Degree of contact with neighbours	Question 8(viii)
68. Family size.	Question 9 and record card
69. Birth order of child	Question 9 and record card
70. Disrupted family	Questions 94(i) and record card

1.4.

Information about the schools

(Except where otherwise stated, this refers to the number)

1. Pupils
2. Classes
3. Staff
4. Staff under 30
5. Staff over 50
6. Graduates on staff
7. Women with children on staff
8. Staff with higher qualifications
9. Men on staff
10. Staff having stayed for three or more years
11. Presence of a Parent Teacher Association
12. Parents seeking interviews per term
13. Meetings and Activities to which parents can come along, per year.
14. Meetings and Activities to which the father can come, per year
15. Social Events per year
16. Type of parental help given *
17. Pupils staying less than one year, for last three years
18. Pupils entering in last three years
19. Ten year olds in the school
20. Meals taken per week
21. Free meals taken per week
22. Incidences of vandalism in last year
23. Incidences of breaking and entering in last three years
24. Pupils absent in last week in March
25. Homework given, type and frequency *
26. Type of restrictions upon taking books home *
27. Use of corporal punishment, instances in last year
28. Type of extra curricula activities *
29. Library books in the school
30. Age
31. Size of classrooms
32. School Average Performance on Picture Intelligence Tests for five years.
33. School Average Performance on Reading Intelligence Tests for five years.
34. School Average Performance on Mathematics Intelligence Tests for five years.

35. Proportion of high scores(20 points)on Picture Intelligence Tests.
36. Proportion of high scores(20 points)on Reading Intelligence Tests
37. Proportion of high scores(20 points)on Mathematics Intelligence Tests
38. Proportion of low soores(20 points) on Picture Intelligence Tests
39. Proportion of low scores(20 points) on Reading Intelligence Tests.
40. Proportion of low scores(20 points)on Mathematics Intelligence Tests.
41. School Average Performance on Verbal Reasoning Tests for two years

In the analysis, the numbers were converted to ratios, either to number of pupils or number of staff.

- * Rated on a five point seale.

1.5

Information from the Development Corporation for each Precinct

1. Population 1.1.73.
 2. Population 1.1.68.
 3. Population Target.
 4. Year of 1st completion
 5. % of population entered before '65.
 6. Emigrants in last 3 years. No.
 7. Immigrants.
 8. % Catholic
 - * 9. Organised leisure activities: No.of female participants
 - * 10. Organised leisure activities: No.of male participants.
 - * 11. Part-time Female
 - * 12. Part-time Male
 13. % population under 15, 1.1.68.
 14. % single parent households
 15. Average household size
 16. No.of dwellings
 17. No.of houses.
 18. Overoccupation, No.of houses.
 19. Underoccupation No.of houses.
 - (.) 20. Playspace, acreage.
 21. Car ownership, cars 1 house
 22. % social class I
 23. % social class II
 24. % social class III non-manual
 25. % social class III manual
 26. % social class IV
 27. % social class V
 28. % retired
 29. % households in which no-one employed
 30. Employees / house
 31. % households employed in Glenrothes
 32. % households no fixed place of employment
 33. % households no place of employment
- All the above information except that marked * or (.) was obtained from the household survey, or from updates thereof.
- * from survey of leisure activities.
- (.) from children's play survey.

1.6.

Information from the Social Work Department

The following information was obtained, for all 13 areas investigated, from the Glenrothes Area Office.

1. Number of families referred to the Social Work Department
2. Number of children referred to the Social Work Department
3. Number of children referred from the Reporter
4. Number of offenders supervised
5. Number of physically handicapped referred to the department
6. Number of mentally handicapped referred to the department
7. Number of mentally ill referred to the department
8. Number of elderly referred to the department
9. Number of foster parent applications.

The Units in which the data was collected

Three types of unit were used when the data was collected:

alphabetic, numeric and rank order. Data such as sex, school attended and membership of a trade union were collected in alphabetic form. Such data was essentially qualitative. Quantitative data was collected in two forms, numeric and rank order.

Numeric data included such items as number of rooms at school, V.R.Q. and family size. Such data was divided by equal intervals, whether of time, percent, score or number. Rank Order was used for questions which did not deal with data with equal intervals, but such questions as 3(i) dealing with frequency of library visiting where the intervals were not equal. Apart from question 2(ii) on level of parental education:

(ii) Did either of you attend any of the following institutions

or courses ? (PLEASE TICK ALL THOSE THAT ARE APPROPRIATE) Rank

Senior secondary or grammar school	2
An apprenticeship	1
A central institution	3
A technical, art or commercial college	3
University, including the Open University	4
The Open University	4
Evening classes for a further qualification	2
Leisure classes	1
A correspondence course	1
Any other form of further education	2

(Please specify.)

All the other questions rank intervals of time.

E.g.

3.(i) Are either of you members of a library Rank
(PLEASE TICK ONE BOX EACH) Yes No 0

If so, how frequently do you visit it ?
Every week 4
Every two weeks 3
Every month 2
Less frequently 1

(ii) Does your child do any reading at home? Yes No 0

Not counting comics, how often does he or she read?
Usually every day 3
2 or 3 times a week 2
Less frequently than this 1

6.(iii)Do you help you child with his or her schoolwork?	Rank
(PLEASE TICK ONE BOX EACH)	
Yes	
No	0
If you do, about how often do you give this help?	
Every day	4
2/3 times a week	3
Every week	2
Less frequently	1

Of the other questions 5 was recorded both alphabetically and numerically because of the possible don's know response.

5. Until what age do you expect your child to remain at school?	
16)
17) Numeric
18)
don't know	Alphabetic

Information from the Education Department about each school

For each test from 1969 to 1973 in picture intelligence, reading ability and mathematics ability, average scores were obtained for each school and for the County as a whole. Also for each test the number of children with scores above quotient 120 and below quotient 85 were given for each school. Eight tests of picture intelligence and reading and six of mathematics were involved.

The total sample size by school and ability was:

	Picture Intelligence	Reading	Mathematics
Carleton	319	223	263
Caskieberran	173	164	148
Pitteuchar	40	40	11
Rimbleton	381	278	280
South Parks	354	248	288
Southwood	333	274	251
Taushall	324	262	224
Warout	266	239	282
Coaltown	60	41	45
Leslie	203	154	165
Markinch	155	121	106
Milton	14	14	11
Thornton	103	76	74

Average scores by school were obtained for the 1973 and 1974 tests of verbal reasoning.

The Units in which the data was collected

1.3

<u>Characteristic</u>	<u>Units in which collected</u>
1. School attended	Alphabetic
2. Sex	Alphabetic
3. Date of Birth	Numerically by month 1 - 12
4. Term of entry into present school)	Numerically
5. Term of entry into a school in Glenrothes)	from 1 - 23
6. Term of commencement of primary education)	Where 1 is the earliest term and 23 to most recent.
7. Number of schools attended	Numeric
8. Nursery Education	Alphabetic
9. Picture Intelligence score '69	Numerically by score
10. Picture Intelligence score '70	- ditto -
11. Reading score '69	- ditto -
12. Reading score '70	- ditto -
13. Mathematics score '69	- ditto -
14. Mathematics score '70	- ditto -
15. Verbal Reasoning Quotient '73	Numerically by Quotient
16. Verbal Reasoning quotient '74	- ditto -
17. Absence in last 12 months	Numerically %
18. Time spent in mixed age classes	Numerically years
19. Meals taken	Alphabetic
20. Free meals taken	Alphabetic
21. Type of house	Alphabetic
22. Tenure of house	Alphabetic
23. No. of rooms in the house	Numeric
24. No. of residents in the house	Numeric
25. Possession of basic amenities	Alphabetic
26. Possession of central heating	Alphabetic
27. Possession of a telephone	Alphabetic
28. Possession of a yard or garden which could be used as a playspace.	Alphabetic
29. Age of the dwelling	Rank Order
30. School leaving age : husband	Numeric
31. School leaving age : wife	Numeric

32. Level of education : husband.	Rank Order
33. Level of education : wife.	Rank Order
34. No. of educational courses taken : husband	Numeric
35. No. of educational courses taken : wife	Numeric
36. Library membership and frequency of) husband visiting a library.)	Rank Order
37. Library membership and frequency of) wife visiting a library)	Rank Order
38. Frequency of child's reading at home	Rank Order
39. Disabled husband	Alphabetic
40. Disabled wife.	Alphabetic
41. Expected school leaving age of the child	Numeric and Alphabetic
42. No. of school visits in past year : husband	Rank Order
43. No. of school visits in past year : wife.	Rank Order
44. A visit to the school without an invitation - husband	Alphabetic
45. A visit to the school without an invitation - wife	Alphabetic
46. Paternal help with the schoolwork	Rank Order
47. Maternal help with the schoolwork	Rank Order
48. Textbooks bought	Alphabetic
49. Satisfaction with child's progress at school	Alphabetic
50. Satisfaction with the school	Alphabetic
51. Work status : husband	Alphabetic
52. Work status : wife	Alphabetic
53. Social Class	Rank Order
54. Wife's occupation	Rank Order
55. Length of residence in present dwelling	Rank Order
56. Length of residence in present locality	Rank Order
57. Reason given for last move	Alphabetic
58. Frequency of family outings	Rank Order
59. Frequency of contact with relatives	Rank Order
60. Membership of an organisation : husband	Alphabetic
61. Membership of an organisation : wife	Alphabetic
62. No. of organisations joined : husband	Numeric
63. No. of organisations joined : wife	Numeric

64. Membership of a trade union : Husband	Alphabetic
65. Membership of a trade union : Wife	Alphabetic
66. Main Locus of leisure activity	Alphabetic
67. Degree of contact with neighbours	Alphabetic
68. Family size.	Numeric
69. Birth order of child	Numeric
70. Disrupted family	Alphabetic

The Social Class Index

The registrar general's classification of social classes was used to classify the main wage earners occupation. i.e:

	Grade
1. Progessional	(1)
2. Intermediate non-manual	(2)
3.n Junior non-manual	(3)
3.m Skilled manual	(4)
4. Semi-skilled manual	(5)
5. Unskilled	(6)

The index of any group was then formed by multiplying the number in any class by the grade assigned (in brackets), computing the total and dividing by the number of persons involved.

e.g.	Class	No.		Grade		Total
	1	2	X	1	=	2
	2	3	X	2	=	6
	3 n	4	X	3	=	12
	3 m	5	X	4	=	20
	4	4	X	5	=	20
	5	2	X	6	=	12
	Total	<u>20</u>				<u>76</u>

$$\text{Index} = \frac{76}{20} = 3.8$$

Similar indices have been used by Wiseman, Fraser and Kellmer Pringle (all opus cited)

The Attainment Tests

The children in the sample were subjected to eight attainment tests, on verbal reasoning ability ,picture intelligence, mathematics and reading.

The Moray House Verbal Reasoning Tests.

There have been a large number of Moray House tests produced on several characteristics, including intelligence ,mathematics and reading abilities. The Moray House Verbal Reasoning Tests which were administered to the children of Fife at the ages of eleven and twelve are in a range which caters for children from the age of seven up to adulthood. These tests originated in 1930 and were for a considerable time updated by Sir Godfrey Thomson. Over 90 forms have so far appeared, at an average of between two and three a year. They consist of 100 items (8 pages) and take 45 minutes to complete in addition to ten minutes being used on a practice test (2 pages). The tests were designed for children between the ages of 10.0 and 12.0 and the items consist of directions, analogies, classification, series completion, sentence completion, jumbled sentences, deciphering codes, and miscellaneous problems including arithmetic. There are no sections, items are presented one after another in order of difficulty. The tests were administered by the class teachers.

After the testing of 20,000 children permanent conversion tables are set up giving the I.Q. corresponding to a given score on each test, and the test is thereafter supplied to Directors of Education only for their use in their areas under the promise that adequate care will be taken to preserve secrecy.

References:

Buros , 'Seventh Mental Measurements Yearbook'.

Emmett, W.G., 'Secondary Modern and Grammar School Performance Predicted by Tests given in Primary Schools.', Br.J.Ed.Psychol. 24:91-8, Je'54.

Nisbet J. and Buchan J., 'The Long Term Follow Up of Assessment at age eleven.', Br.J.Ed.Psychol. 29:1-8, F'59.

Slater P., 'Review in Buros, 'Sixth Mental Measurements Yearbook' Thomson G.H. 'What are Moray House Tests?', Univ. London Press.

Moray House Picture Test.

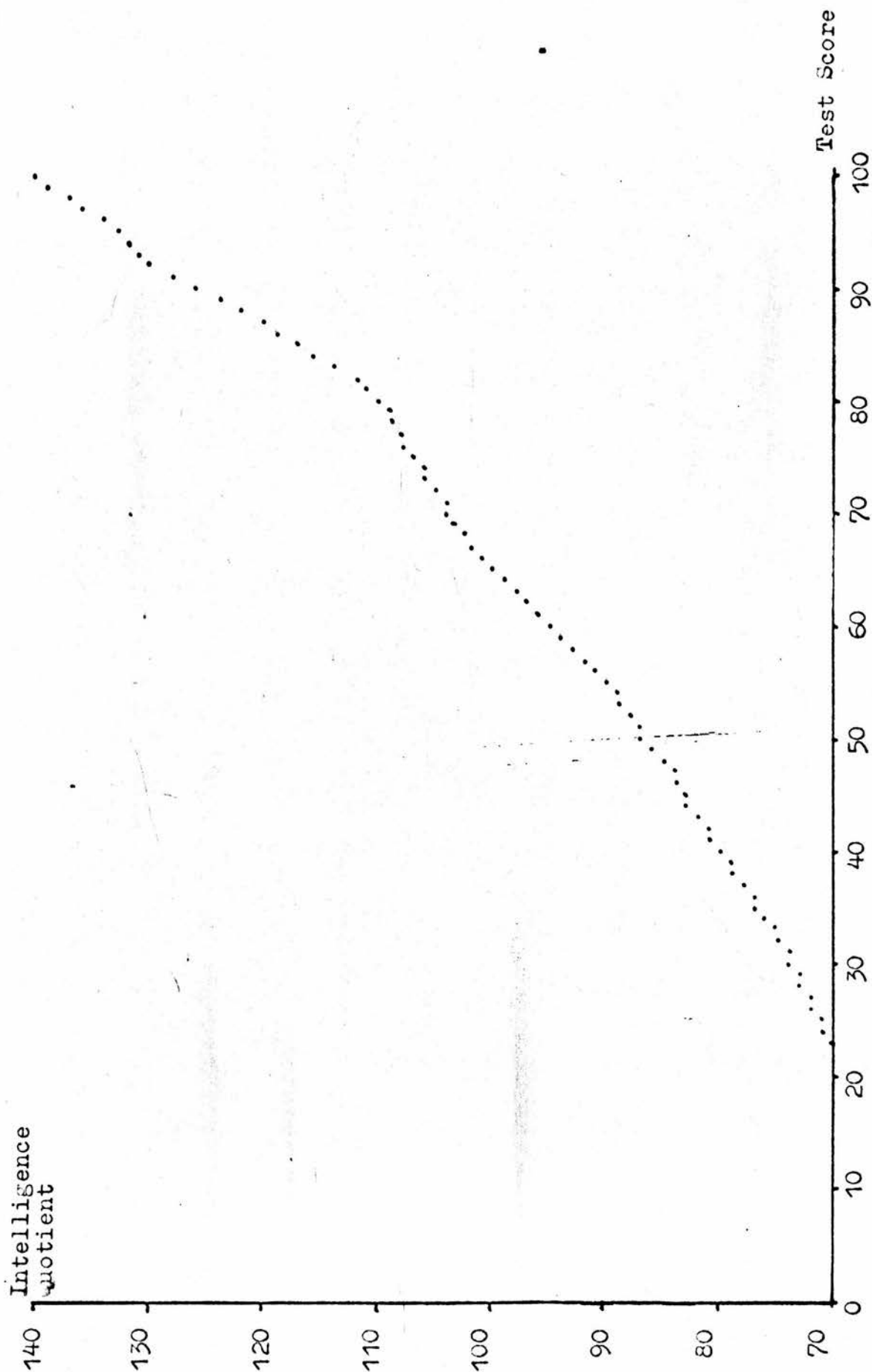
This test was designed for seven year olds and consists of one hundred items grouped as nine subtests. These are; directions, doesn't belong, completion, absurdities, sequence, reversed similarities, always has, analogies and series (visual motor coding). No reading or writing is involved. Except for the first sub-test, responses are made by putting a cross through, a ring around or a line through pictures. In the first sub-test children have to follow verbal instructions. Each sub-test except the first has three practice items.

Two supervisors are essential and some demonstration material is required in advance. The actual working time on the whole test is 25 minutes which is strictly adhered to, but there is a recommended break between sub-tests 4 and 5. Not more than 30 children should be tested at one go and each child must have a separate desk facing one way.

The test was constructed between 1941 and 1943. Standardisation was carried out on the first complete year group of 5,415 Edinburgh children aged 6.9 to 7.8. They had a raw mean score of 52.50, - Standard Deviation 20.26. A second group of 2,692 children from 90 schools in England were tested in 1944 and produced a mean score of 58.14, - Standard Deviation 19.59. The conversion table is based on the combined score of all 8,107 children. Reliability has been correlated using Ferguson's method at .958.

Together with all the other tests given to seven year olds, this test was restandardised for Five children.

The Inter-relation of Noray House Picture Intelligence Test Score and Intelligence Quotient.



References:

- Buros, 'Seventh Mental Measurements Yearbook'.
- Kellmer Pringle,M. and Keir,G., Review of antecedent test in Buros, 'Fourth Mental Measurements Yearbook'.
- Perry,S.,Review in West Sussex Education Committee;Psychological Service,'Assessment of Intelligence',pp.24-25. 1974.

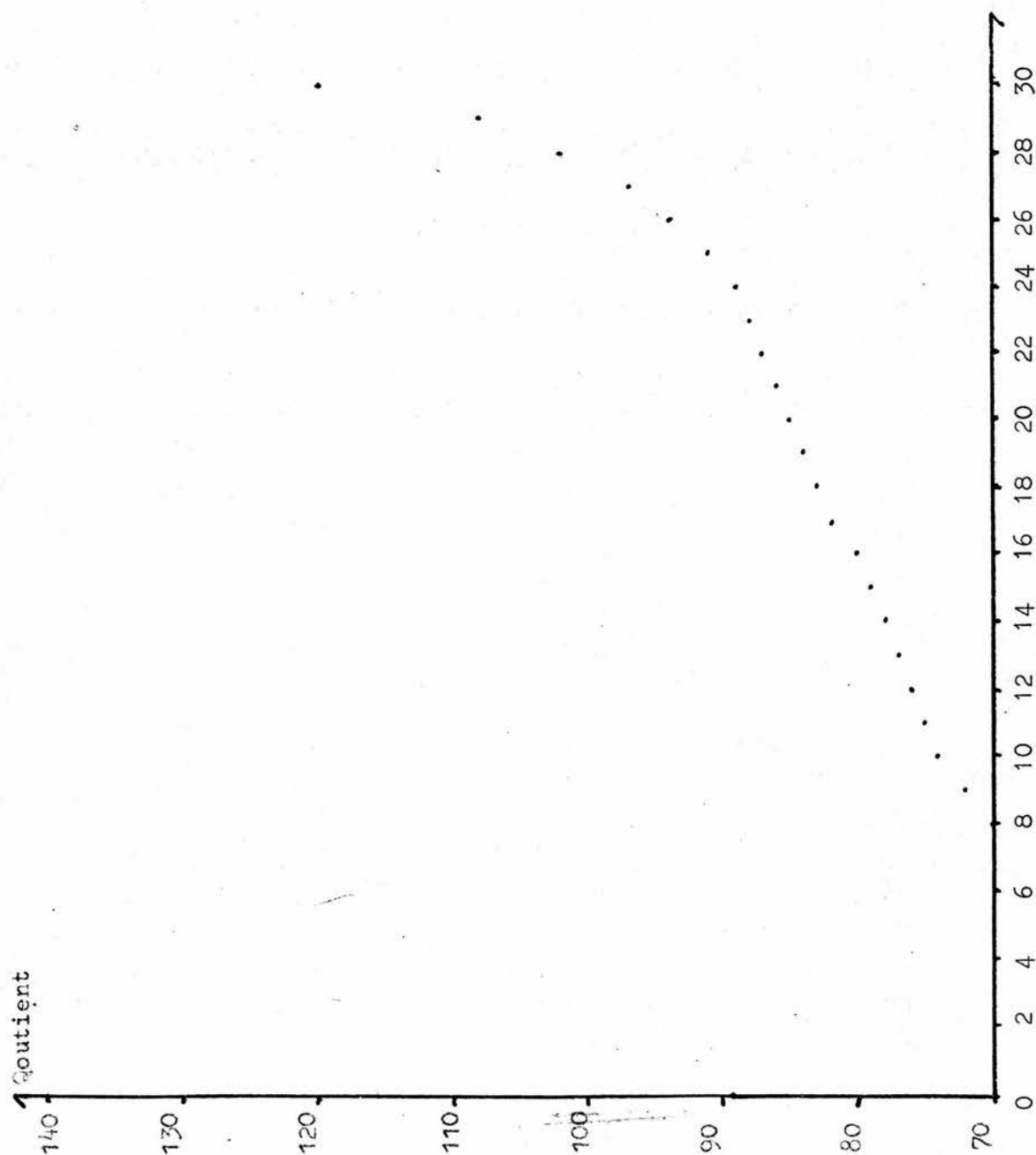
Vera Southgate Reading Test

This is a word selection test designed for children from six to eight years of age and consists of 30 items ,which consist of five words, one of which is read aloud by the teacher and ringed by the pupil.16 of the items are accompanied by a drawing illustrating the word. 450 words were selected from 676 items on the basis of item analysis. The test was standardised on all the children in Worcester's 32 infant and junior schools aged between 5 years 8 months and 8 years 1 month.Three parallel forms are available to facilitate re-testing. The raw scores of a group of 96 children correlated at .95 between these parallel forms. No more than 15 to 20 children should be tested at one sitting. The validity of the test was measured by correlation with performance on five individual word reading tests, with an average correlation of .90, and with teachers' estimates of reading ability (rank correlations of .87 and .95 for an earlier form of the test). There is no time limit for the test but it usually takes 15 to 20 minutes.Norms are provided for converting scores into reading ages from 5.9 to 7.9.Professor M.D.Vernon has commented that the test was 'Probably the best of its kind available'.

References:

- Kellmer Pringle M. and Vernon M.D., Reviews in Buros,'Sixth Mental Measurements Yearbook'.
- Vernon,P.E.,Review in Brit.J.Ed.Psychol.30:83.Je'60.

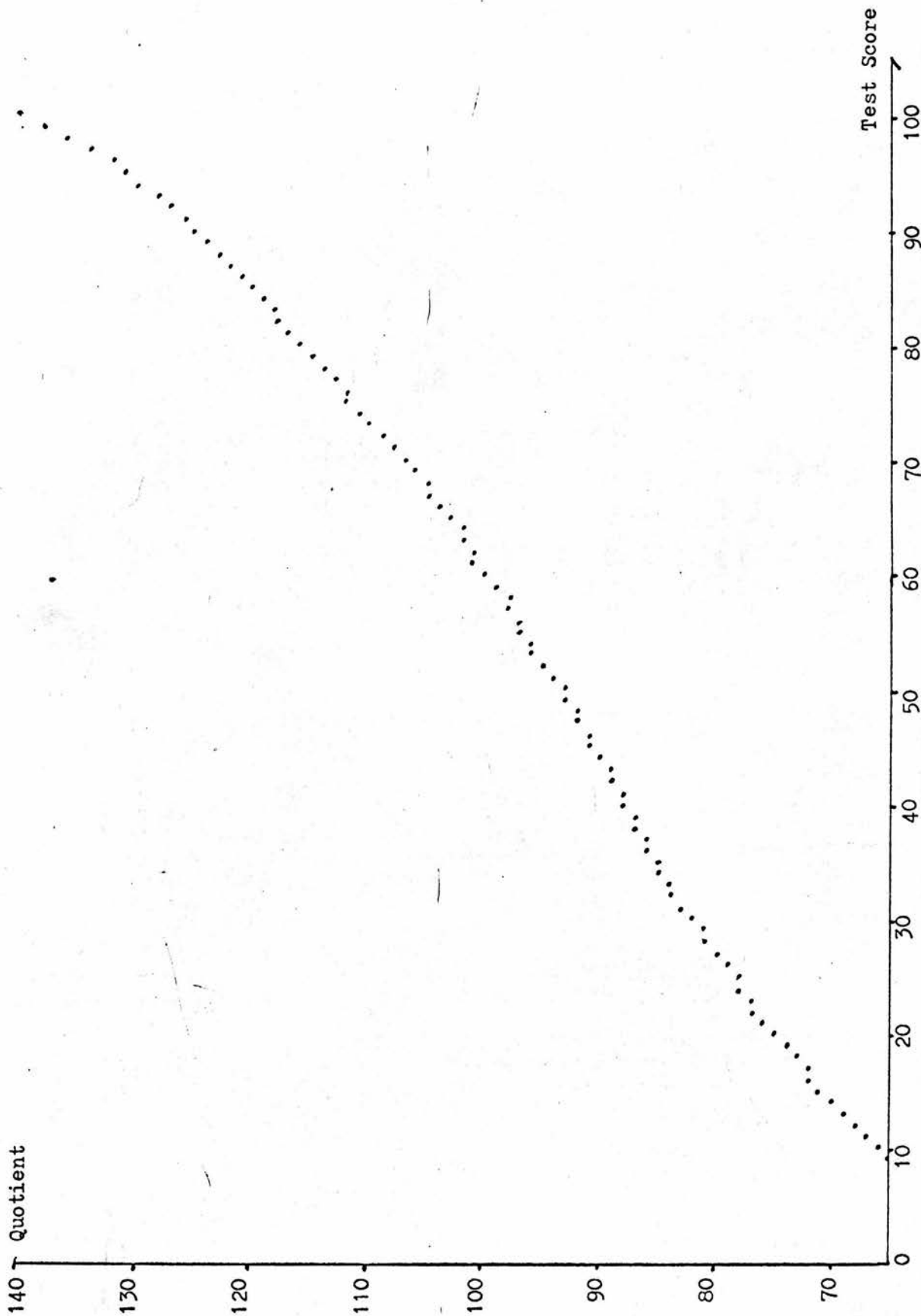
The Inter-relation of Reading Test Score and Reading Quotient.



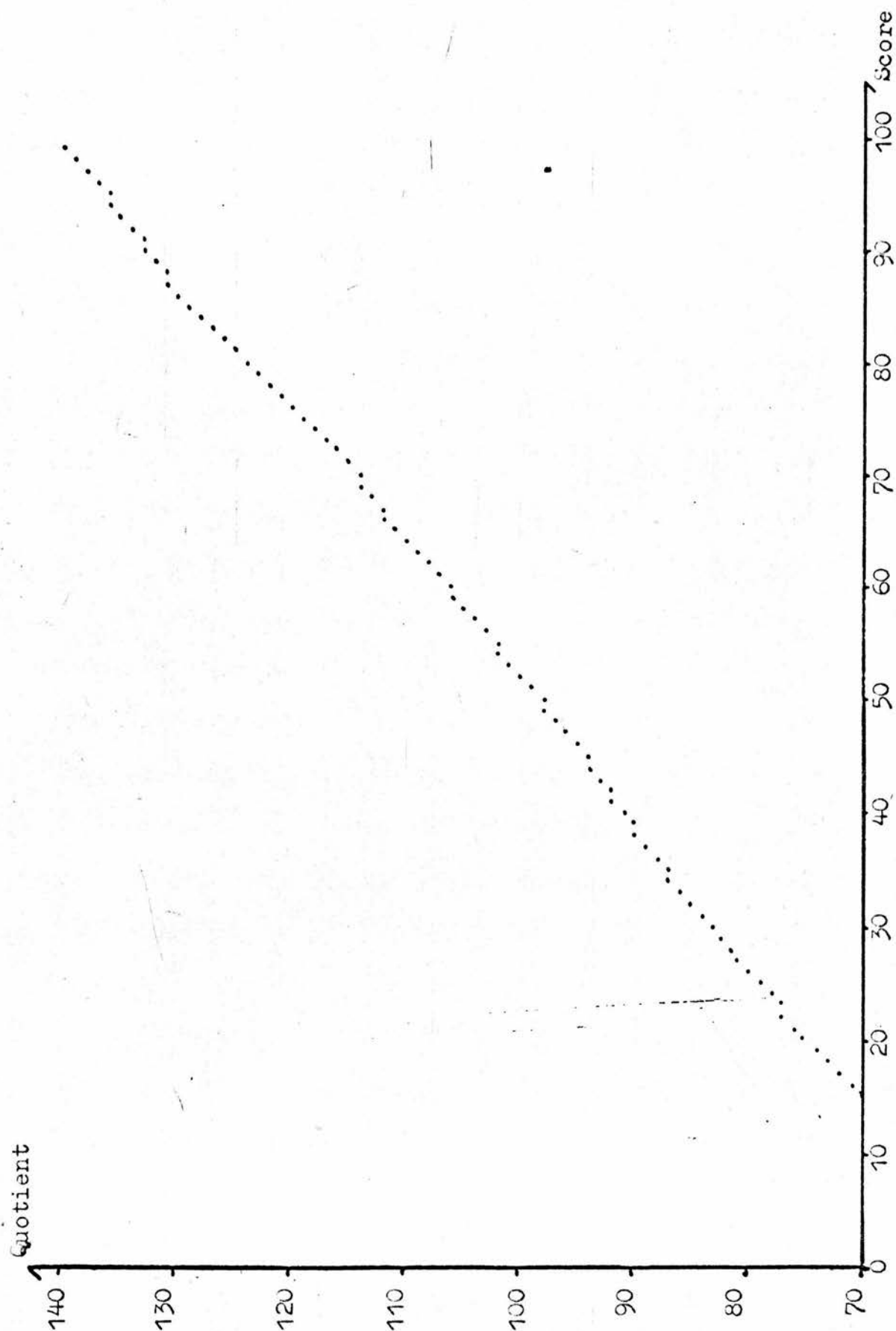
Mathematics Tests

The two tests of mathematics administered to the pupils each consisted of one hundred items of varying degrees of difficulty and mainly concerned with arithmetical problems. The tests intercorrelated at the .92 level on a sample of 43 pupils drawn from the area of investigation. The tests have been discontinued in Fife because of the rapidly changing methods of teaching mathematics in primary schools, which increasingly involve concepts which are not commonly associated with arithmetic and which involve considerable differences in curriculum between schools. The two tests correlated at above .79 with the other tests of attainment.

The Inter-relation of Mathematics Test Score and Mathematics Quotient : 1969



The Inter-relation of Mathematics Test Score and Mathematics Quotient, 1970



Appendix II

The Relationships of the Individual Indicators
to attainment

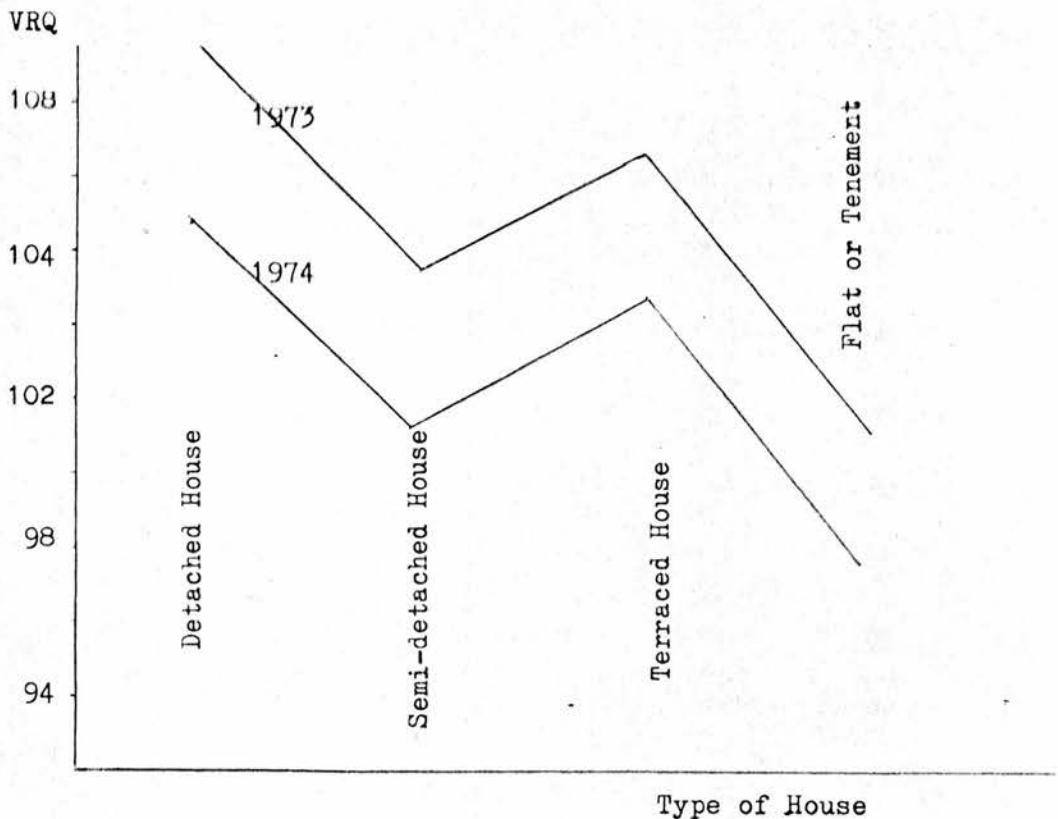
1. School Attended - see Chapter Eleven
2. Sex - Girls scored higher than boys on all the tests. On 4 this difference was significant at the .05 level

The tests were: Picture Intelligence '70
 Reading Ability '69
 Reading Ability '70
 Verbal Reasoning '74
3. Date of Birth - Correlated with attainment scores at a weighted average of - .0158. Only one of the eight individual coefficients of which only 2 were positive was significant at the .05 level, that with mathematics ability 1969 (-0.2093). The coefficients with both tests of verbal reasoning ability were - .0073 and - .0344.
4. Term of entry into school being attended - Only one coefficient was significant at the .05 level, that with Picture Intelligence '69 (.1288). Six coefficients were positive and two negative (both tests of V.R.Q.).
5. Term of entry into a school in Glenrothes - see Chapter Ten
6. Term of commencement of primary education - The only significant coefficient was with Reading Ability, '69 (.1729). Seven were positive and one negative. The coefficients with verbal reasoning ability were .0177 and .0161.
7. Number of Previous Schools - There were no significant associations with any of the attainment criteria. Of the eight coefficients, the two with V.R.Q. were negative, whilst the other six were positive.
8. Nursery Education - The response rate was too low for accurate investigation.
- 9 to 16. The Attainment Criteria
17. Absence in last 12 months - Two coefficients with attainment criteria were significant at the .05 level (both verbal reasoning

tests at -0.1045 and -0.0894 . All eight coefficients were negative.

18. Time spent in mixed age classes - On all these three variables,
19. Meals taken - the response rates were too
20. Free Meals taken - low for accurate investigation.
21. Type of House - Considerable differences were found in scores between occupants of different types of house. Those resident in detached houses had significantly higher scores than those in flat or tenement type dwellings.

Type of house and verbal reasoning quotient



22. Tenure of House - Owner occupiers' children scored higher on seven of the eight tests, than those of tenants. Three of these differences were significant at the .05 level.

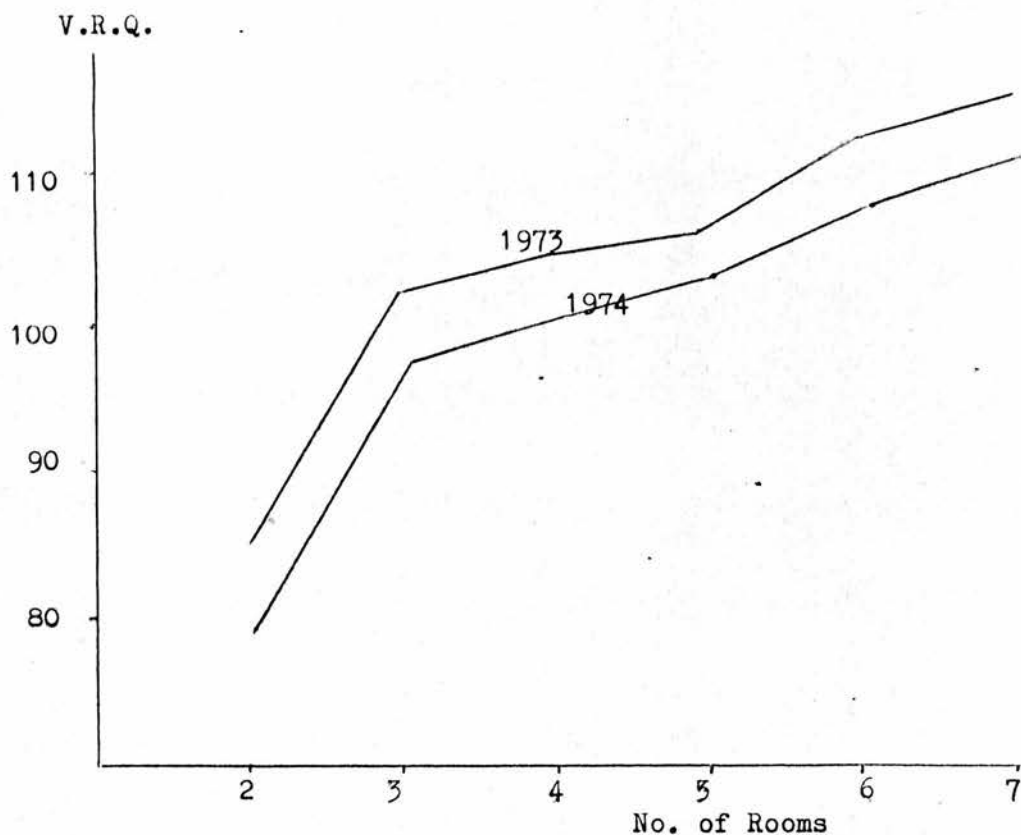
Significant Differences between owner occupiers and tenants

<u>Test</u>	<u>Owner Occupiers Score</u>	<u>Tenants Score</u>	<u>Probability</u>
Mathematics '69	67.167	58.210	.020
Verbal Reasoning '73	110.538	103.837	.0001
Verbal Reasoning '74	106.301	99.758	.0001

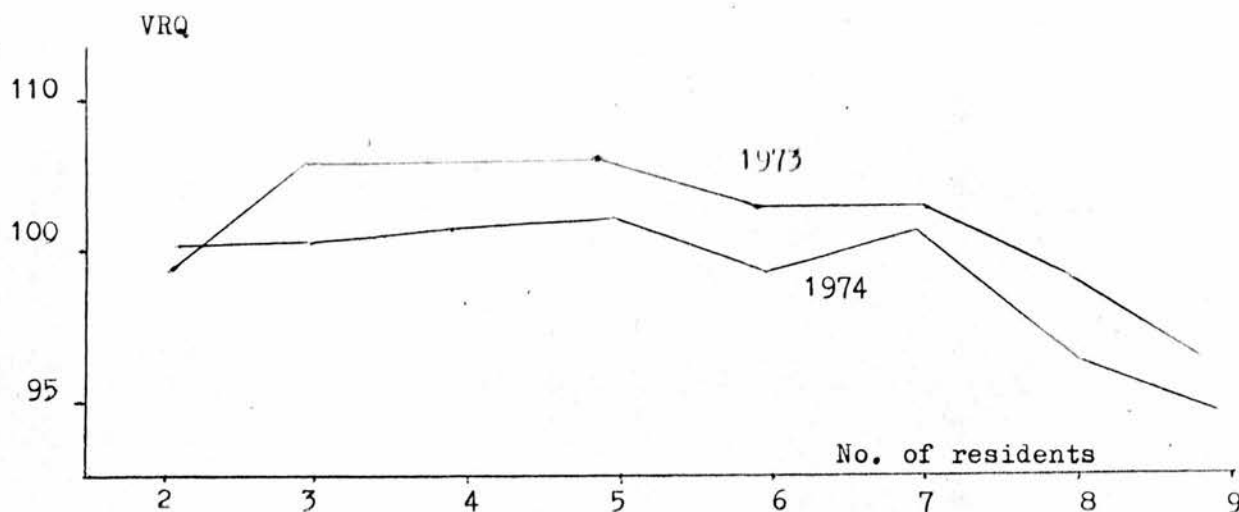
23. No. of Rooms in the House - All eight tests showed significant Positive correlations with number of rooms.

<u>Test</u>		<u>Correlation Coefficient</u>
Picture Intelligence	'69	.3071
Picture Intelligence	'70	.3617
Reading	'69	.2957
Reading	'70	.2597
Mathematics	'69	.2905
Mathematics	'70	.2670
Verbal Reasoning	'73	.2303
Verbal Reasoning	'74	.2577

23. No. of Rooms and Attainment



24. No. of Residents in the House



The two coefficients with verbal reasoning quotient ($-.1085$ and $-.1016$) were significant at the $.05$ level. All eight coefficients were negative. These coefficients were determined largely by households of over seven in number, of which there were only 14, and entirely by those of over five.

25. Possession of Basic Amenities - Only five respondents indicated a lack of one of the basic three amenities, toilet, bath and hot and cold running water, and these scored much lower than the rest of the population.

	<u>Verbal Reasoning Quotients</u>	
	<u>1973</u>	<u>1974</u>
Lacking an amenity	90.400	85.200
Not lacking an amenity	105.526	101.405

26. Possession of Central Heating

Possession of this amenity was associated with higher scores on seven out of eight tests. Five of these differences were significant at the $.05$ level, these were Picture Intelligence 1969, Mathematics Ability both 1969 and 1970, Verbal Reasoning Ability, both 1973 and 1974.

27. Possession of a Telephone - Possession of this amenity was associated with higher scores on seven out of eight tests. Two of these differences were significant at the .05 level, both on tests of verbal reasoning.

28. Possession of a yard or garden which could be used as a playspace 13 respondents replied negatively to this question. Lack of this amenity was associated with lower scores on both tests of verbal reasoning and on the 1974 test this was significant at the .05 level, the difference was 8.25 quotient points.

29. Age of the Dwelling

On all tests, residents of dwellings built since 1960 scored higher. On all tests except that of reading in 1969 this advantage was significant beyond the .05 level of probability. An advantage of seven points in verbal reasoning quotient was associated with this on both tests of verbal reasoning.

30 to 35. The Parental Education Variables: Correlation Coefficients

<u>Test</u>	<u>School leaving age</u>		<u>Level of Education</u>		<u>No. of Educational courses</u>	
	Husband	Wife	Husband	Wife	Husband	Wife
Picture Intelligence '69	.1995	.2204	.2175	.3171	.1839	.2747
(proby)	.017	.006	.007	.001	.022	.001
Picture Intelligence '70	.1411	.0918	.2345	.1103	.1051	.1452
Reading '69	.0766	.1585	.1283	.0426	.0789	.0347
Reading '70	.2690	.1268	.2684	.0047	.1743	.0742
(proby)	.043		.040			
Mathematics '69	.1303	.1954	.1402	.1886	.1425	.1487
(proby)		.015		.019		
Mathematics '70	.0211	.1237	.2880	.0822	.1354	.0892
(proby)			.028			
Verbal Reasoning '73	.2177	.2688	.2983	.2379	.2721	.2379
(proby)	.001	.001	.001	.001	.001	.001

Verbal							
Reasoning	'74	.2488	.2486	.2982	.2424	.2465	.2189
(proby)		.001	.001	.001	.001	.001	.001
Average							
Coefficient		.1630	.1793	.2342	.1521	.1673	.1344

Average male coefficient = 0.1882

Average female coefficient = 0.1553

The coefficients for the abilities in mathematics and reading were considerably smaller than those in Picture Intelligence and Verbal Reasoning.

Parental Library Membership and frequency of visiting a library

36. Husband's membership of a library and frequency of visiting

Library membership is associated with children's higher scores on all the tests. It is significant at the .05 level on five tests, picture intelligence '69, reading '69 mathematics '69 and verbal reasoning '73 and '74. On the latter two an advantage of 7 points in V.R.Q. was associated with husband's library membership. Frequency of visiting was also associated with higher scores. Coefficients of .2840, .2922, .2755 and .2868 are found with picture intelligence '69 and '70 and with verbal reasoning '73 and '74, respectively. All these are significant at the .05 level and three at the .005 level of probability.

37. Wife's membership of a library and frequency of visiting

Here membership was also associated with higher scores on all eight tests, significantly so on picture intelligence '69 and both verbal reasoning tests. In the case of the latter two, it was associated with an advantage of six points in V.R.Q. Apart from the differences associated with membership and non-membership, i.e. visiting and not visiting, there was no significant relationship between children's performance and the frequency of the wife's visits to the library.

38. Frequency of Child's Reading at home - Two of the eight tests showed a significant correlation coefficient with this variable, both of those of verbal reasoning ability, with coefficients of .3258 and .3212 respectively (both significant at the .001 level). Five out the remaining six tests showed positive signs.

Disabled Parents

39. Disabled Husband.

40. Disabled Wife.

Nine positive responses were found to question 39 and six to question 40. In the case of question 39, disabled husband, this was associated with a verbal reasoning quotient of 14.8980 points below the rest of the sample, this deficit was significant at the .002 level. With question 40, disabled wife, the deficit was found to be 4.6481 points.

41. Expected School Leaving Age of the Child - All eight correlation coefficients with attainment were significant at the .002 level, and seven at the .001 level. They were as follows:

<u>Test</u> -	Picture Intelligence		Reading Ability		Mathematics Ability		Verbal Reasoning	
	'69	'70	'69	'70	'69	'70	'73	'74
Correlation Coefficient	.4132	.5200	.3417	.4360	.3659	.4363	.5354	.5383

giving an average of 0.4484

Verbal Reasoning Quotients were different for expected ages of leaving school.

Expected School Leaving Age: 16 years 17 years 18 years.

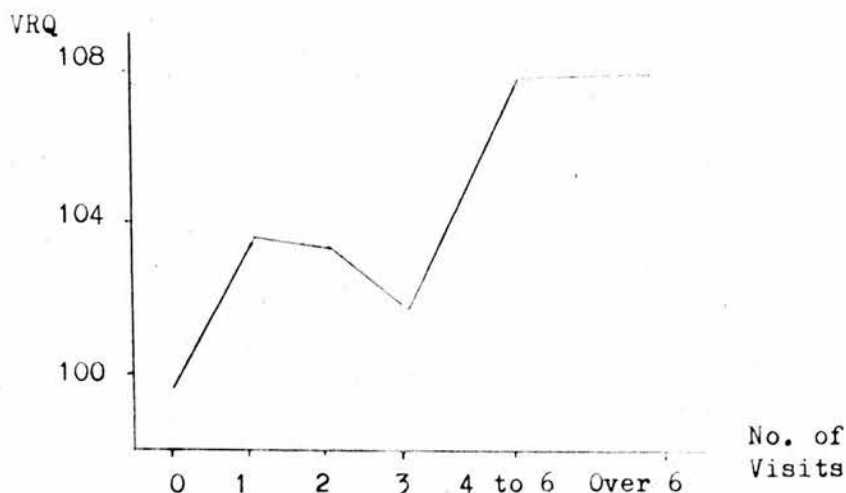
Average V.R.Q. 94.483. 105.239. 111.309

Number of School visits mad in past year by the parents

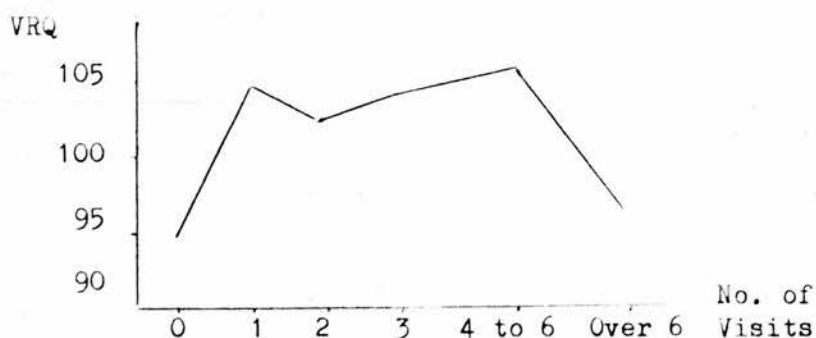
42. No. of School visits made in past year by husband - Two significant positive correlations were found with attainment, .1416 and .1177

with each test of verbal reasoning. Four of the other six coefficients were positive. The average was: .0622.

Only 324 answered this question (cf. 396 answering q.43) giving an average V.R.Q. on test 16 of 102.580 (cf. 101.402 on q.43). It is to be assumed that the bulk of those not answering did not visit the school.



43. No. of School visits made in past year by wife. - All eight correlations with attainment rendered negative coefficients, two of which reached the .05 level of significance. The coefficients with reading and mathematics abilities on the 1970 tests were -0.3709 and -0.2786. The average on all the tests was -0.1266. This result is contrary to expectation, and is explained by the low scores of those whose mothers have made many visits. The Histogram below demonstrates this.



Only 16 wives replied that they did not visit the school and this was associated with a deficit of 9.953 points in the verbal reasoning quotient, over the rest of the sample who visited the school.

A Visit to the School without an Invitation

44. A Visit to the School without an invitation - Husband - 59 replied positively to this question. On five visits this was associated with a higher score; both of picture intelligence, reading ability '70, and both of verbal reasoning ability. On the other three it was associated with a lower score. None of the differences was significant beyond a .15 level of probability.
45. A Visit to the School without an invitation - Wife - 160 replied positively to this question. On two tests it was associated with a higher score, picture intelligence '70 and reading ability '70. On neither was the advantage statistically significant. However on four of the six other test, were the children of parents who had not made an uninvited visit and better, this advantage was statistically significant. These were:

	<u>Test</u>	<u>Difference</u>	<u>Probability</u>
Reading	'69	1.5454	.019
Mathematics	'69	8.9211	.005
Verbal Reasoning	'73	4.4333	.001
Verbal Reasoning	'74	4.6640	.001

Parental Help with Schoolwork:

46. Parental help with schoolwork.
47. Maternal help with schoolwork.

Only 17% of husbands and 5% of women replied that they did

not help their children with their schoolwork. In both cases this was associated with lower scores on their children's part.

48. Textbooks bought: 67 replied positively to this question. On seven out the eight tests, this was associated with a lower score. On no test was this significant at the .05 level. On only one test was this probability beyond the .3 level.

49. Satisfaction with child's progress at school - 44 replied that they were dissatisfied with their child's progress. On all tests this was associated with a lower score. On four this was significant at the .05 level. These tests were:

<u>Test</u>	<u>Score</u>	
	<u>Difference</u>	<u>Probability</u>
Reading '69	4.1598	.013
Mathematics '69	14.2079	.012
Verbal Reasoning '73	8.4406	.000
Verbal Reasoning '74	6.8807	.002

50. Satisfaction with the school - 36 replied that they were dissatisfied with the school. On three tests this was associated with a higher score, both tests of picture intelligence, and the '74 test of verbal reasoning. On the remaining five, it was associated with lower scores. None of the probabilities exceeded .25.

51. Work Status - husband - 13 replied that they were not employed. 3 replied that they were employed part time. The scores of those employed part time did not differ appreciably from those employed full time. However those employed not at all had average scores some 15 points below average on both verbal reasoning tests.

52. Work Status - Wife - 137 replied that they were employed full time, 128 part time and 122 not at all. No significant differences were found between the three groups.

53. Social Class - This referred to the main wage earners occupation.

This was graded from 1 to 6 based on the registrar general's classification, as follows.

Social Class :	I	II	III Non-manual	III Manual,	IV	V
Index :	1	2	3	4	5	6

All correlation coefficients with the eight test scores were negative and five were significant at the .05 level. They were as follows:

Test	<u>Picture Intelligence</u>		<u>Reading</u>		<u>Mathematics</u>		<u>Verbal Reasoning</u>	
	'69	'70	'69	'70	'69	'70	'73	'74
Coefficient	-.1820	-.3760	-.0817	-.3292	-.1036	-.2608	-.2782	-.25
Probability	.004	.001	.200	.001	.102	.010	.001	.0

54. Wife's Occupation - This was classified in exactly the same way as the husband's occupation, i.e. by social class. All correlation coefficients were negative with regard to attainment and two were significant at the .001 level, both '73 and '74 tests of verbal reasoning ability, correlated with coefficients of 0.2892 and 0.2659 respectively. The average coefficient was 0.1757 for all eight tests.

55. Length of Residence in Present Dwelling - All the coefficients with attainment were negative, but none reached to .05 level of significance. The average coefficient was 0.0813.

56. Length of Residence in Present Locality - Three of the coefficients with attainment were positive, those with mathematics ability, '69 and verbal reasoning ability, '73 and '74 and the remainder negative. None of the coefficients produced a probability of even the 0.1 level. The average coefficient was .0684.

57. Reason given for last move - see Chapter Nine

58. Frequency of Family Outings - There was a significant correlation coefficient at the .05 level with attainment on three tests, picture intelligence '69 and both tests of verbal reasoning ability, where the coefficients were .1747, .1734 and .1551 respectively.

59. Frequency of Contact with Relatives - A lower frequency was correlated positively with attainment on all eight tests. On two tests this reached the .05 level, the '70 test of Reading Ability (.3428) and the '73 test of Verbal Reasoning Ability (.1050). The average coefficient was 0.1223 for all eight tests.

Parental Membership of a formal Organisation

60. Membership of any Organisation - husband - On seven out of eight tests, this was associated with a higher score, although on only one, the 1970 test of mathematics ability, did this reach statistical significance.

61. Membership of any Organisation - Wife - On all eight tests, this was associated with a higher score. On four significantly so.

These were:

Test	Advantage	Probability	Cf. Advantage for Husband
Picture Intelligence '69	5.9688	.043	1.2711
Mathematics '69	7.0403	.037	2.7064
Verbal Reasoning '73	4.6408	.002	2.3763
Verbal Reasoning '74	3.7274	.011	2.0856

256 responded yes to question 60 and 202 to 61.

Number of Organisations member - (62) Husband
(63) Wife.

All coefficients were positive, six significantly so for the husbands and four for the wives.

Significant correlation coefficients between No. of organisations joined by parents and attainment scores of children

<u>Test</u>		<u>for husband</u>	<u>for wife</u>
Picture Intelligence	'69	.2054	.2717
Picture Intelligence	'70	-	-
Reading	'69	-	-
Reading	'70	.2587	-
Mathematics	'69	.1720	.2396
Mathematics	'70	.2793	-
Verbal Reasoning	'73	.1968	.2509
Verbal Reasoning	'74	.1968	.2312

Membership of a Trade Union: (64) Husband

(65) Wife

In all cases, a higher score was associated with membership of a Trade Union. In the case of the husband, on four tests, this was significant at the .05 level.

<u>Test</u>	Score advantage associated with husbands membership of a Trade Union	<u>Probability</u>	Score advantage associated with wife's membership of a Trade Union
Reading '70	2.3794	.035	2.4592
Mathematics '70	10.2305	.009	4.8333
Verbal Reasoning '73	4.4975	.003	3.1026
Verbal Reasoning. '74	4.4077	.003	2.5174

66. Main Locus of Leisure Time Activity - Those stating that the main locus of their leisure activity was inside the house had children scoring higher on five out the eight tests. None of the differences produced a probability near the 0.1 level.

67. Degree of Contact with Neighbours - 223 replied that they had visited their neighbours in their houses and 187 replied that they had not. In seven out of eight tests those who had visited their neighbours in their houses, had children who scored higher. On two tests this was significant at the .05 level. Both the tests were of verbal reasoning ability.

68. Family Size - All eight of the correlation coefficients with attainment were negative and three were significant at the .05 level, these were with reading ability, '70 and verbal reasoning ability, both '73 and '74. The average coefficient was 0.1337.
69. Birth Order - In six out of eight cases, these were negative coefficients between birth order and attainment scores. In two cases, this was significant at the .001 level, on both tests of verbal reasoning ability, with coefficients of .1484 and .1441. The average correlation coefficient was .0838.
70. Disrupted Family - On all eight tests, this was associated with a lower score for the 18% of the sample in this position on both tests of verbal reasoning this deficit was significant at the .001 level of probability.

Appendix III

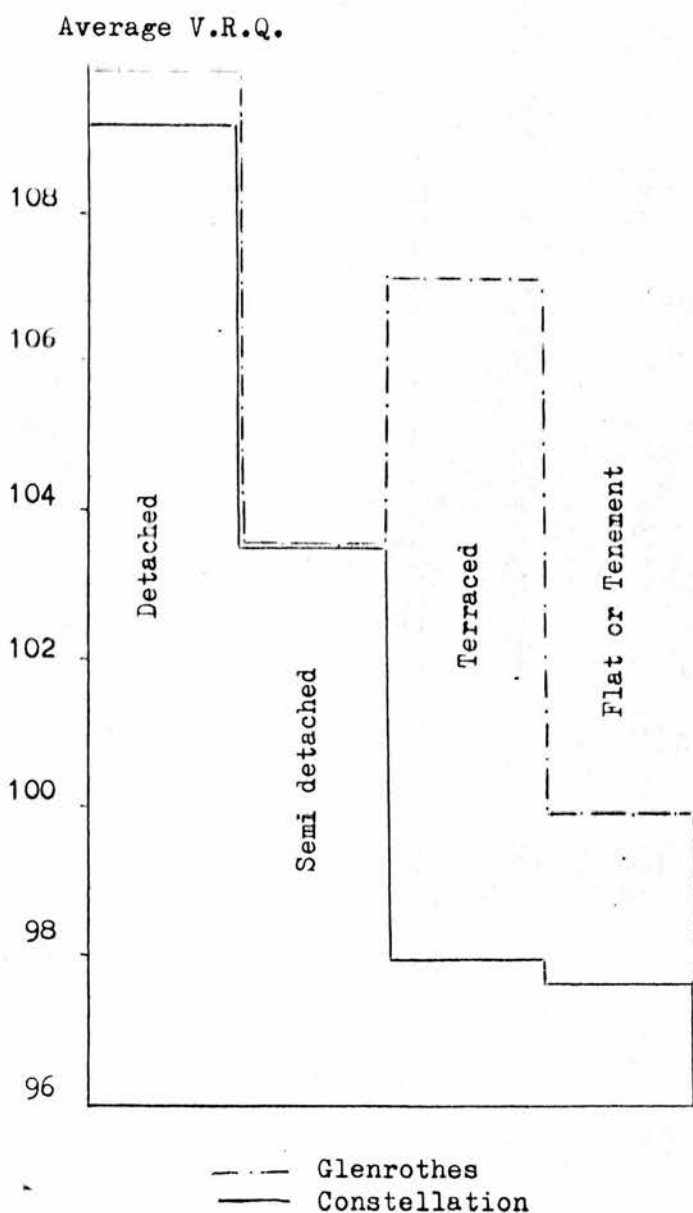
The Relationships of the Individual Indicators

to attainment in the situations in

Glenrothes and the Constellation

2. Sex - In Glenrothes the girls consistently outscored the boys by some 3 or more quotient points. In the Constellation both scores came out about level. In both samples there were more girls than boys.
3. Date of Birth - In neither case were any of the eight correlation coefficients with attainment statistically significant. The respective average coefficients for Glenrothes and Constellation were - .02996 and - .00383, a difference of .02613.
4. Term of entry into school being attended (Length of attendance at present school.) The average correlation coefficients with attainment were .0038 and .1492 for Glenrothes and the Constellation respectively, a difference of .00987. In both cases the indicated association was between high score and brevity of attendance at present school. However neither were there any significant coefficients.
6. Term of commencement of primary education - In neither case were any of the eight correlation coefficients with attainment statistically significant. They averaged at .0485 and .1029 respectively, a difference of .0544. In both cases the association indicated was between brevity of education and high attainment.
7. Number of previous schools - In neither case were any of the correlation coefficients with attainment statistically significant. The average were .0417 and .0910 for Glenrothes and the Constellation respectively, a difference of .0493. In both cases, the association was between a high attainment and a large number of schools.
17. Absence - In both cases there was a slight negative average correlation between attainment and absence, however the coefficients were very small at .0583 and .0253 for the New Town and the Constellation respectively, a difference of .0330.

21. Type of House - In both cases, residents of detached houses scored significantly better than those of flats or tenement type dwellings, with those in semi-detached and terraced housing midway. However in Glenrothes, those in terraced housing tended to score higher than those in semi's. This was significant at the .05 level on both verbal reasoning tests.



22. Tenure of House - Owner occupation was associated with higher scores in both areas on seven out of the eight tests. It demonstrated a significant difference at the .01 level of probability on both tests of verbal reasoning ability in both areas, the differences being six and eleven points of V.R.Q. for the New Town and the surrounding area respectively.
23. Number of Rooms in the House - Both the New Town and Constellation samples evidenced significant positive correlations with the attainment variables. However the New Town Coefficients were considerably smaller.

<u>Test</u>	<u>Correlation Coefficients</u>		
	<u>Glenrothes</u>	<u>Constellation</u>	<u>Difference</u>
Picture Intelligence '69	.2942	.2544	- .0398
Picture Intelligence '70	.3699	.5320	.1630
Reading '69	.2072	.4259	.2187
Reading '70	.1890	.4935	.3045
Mathematics '69	.2439	.3190	.0751
Mathematics '70	.2465	.4153	.1688
Verbal Reasoning '73	.1803	.3903	.2100
Verbal Reasoning '74	.2053	.4114	.2061
Average	-	-	.1633

24. Number of Residents in the House - The average difference in correlation coefficients between the Glenrothes and Constellation samples, with regard to attainment was .0132.
25. Possession of Basic Amenities - Four respondents were from Glenrothes and one was from the Constellation. All five evidenced scores below average.

26. Possession of Central Heating - In both cases, on seven out of eight of the tests, those from homes with central heating did better. 55% of those in Glenrothes had central heating and 57% of those outside the New Town did also. In both areas the groups with central heating scored significantly higher than those without, the advantage in Glenrothes being some 4 points in verbal reasoning quotient compared to about 10 points in the Constellation.
27. Possession of a Telephone - In Glenrothes, where 60% possessed the facility none of the tests evidenced a significant advantage to the possessors of telephones and three tests indicated a deficit. However in the Constellation, where 40% possessed the amenity, on all eight tests an advantage was noted, significant on three of them. Picture Intelligence '70, and Verbal Reasoning '73 and '74 at the .005 level. The advantage in quotients points was 11 on the verbal reasoning tests for the Constellation sample compared with just under two in Glenrothes.
28. Possession of a Yard or Garden which could be used as a Playspace
Sixteen residents of Glenrothes indicated a lack of this amenity compared to two of the Constellation. Both groups had scores considerably below the average.
29. Age of the Dwelling - In both Glenrothes and the Constellation, residents in dwellings built since 1960 children who scored higher.

<u>Verbal Reasoning</u> <u>Quotients.</u>	<u>Age of Dwelling</u>		<u>Differ- ence</u>	<u>Probability</u>
	<u>After 1960</u>	<u>Before 1960</u>		
<u>Glenrothes</u>	107.846	101.250	6.596	.001
(No.)	(227)	(112)		
<u>Constellation</u>	111.071	99.976	11.095	.001
	(28)	(42)		

This advantage was replicated in all eight tests, although most did not attain the .05 level of probability. 67% of the Glenrothes population lived in houses built since 1960, while 40%

of the population of the Constellation also did.

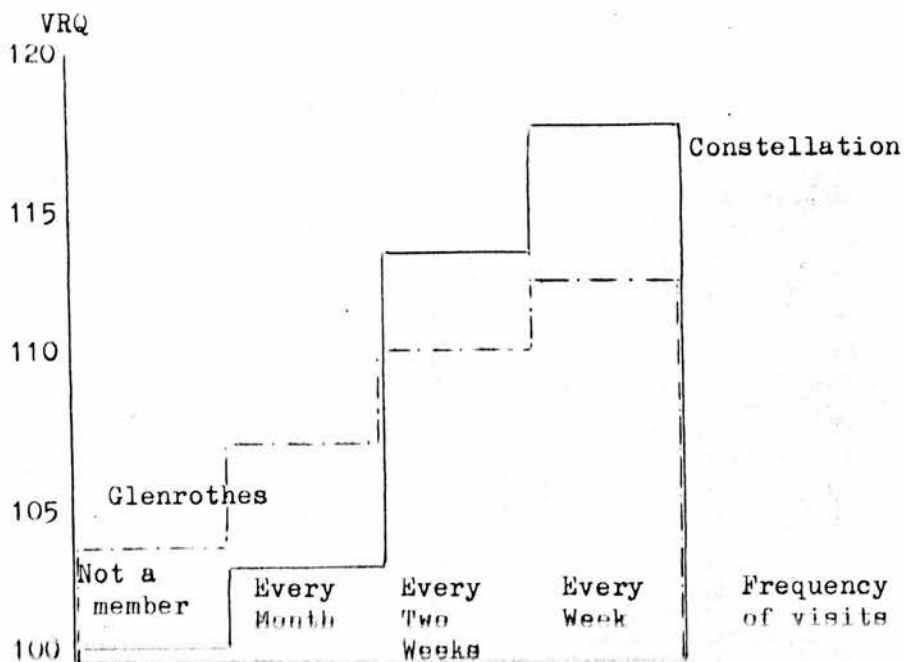
Variables 30 to 35 about Parental Education - In both areas there was a significant relationship between the scores of the child and the education of the parents. The correlation coefficients for the Constellation were somewhat larger. Below, the overall averages are presented and a comparison for the verbal reasoning tests where all 24 intercorrelation were significant at the .01 level.

	Average for all attainment tests	
	<u>Glenrothes</u>	<u>Constellation</u>
30. Husband: School leaving age.	.1194	.2690
31. Wife : School leaving age.	.1592	.2994
32. Husband: Level of education.	.2273	.2691
33. Wife : Level of education.	.1304	.1862
34. Husband: No. of courses taken.	.1653	.2044
35. Wife : No. of courses taken.	.1245	.1984

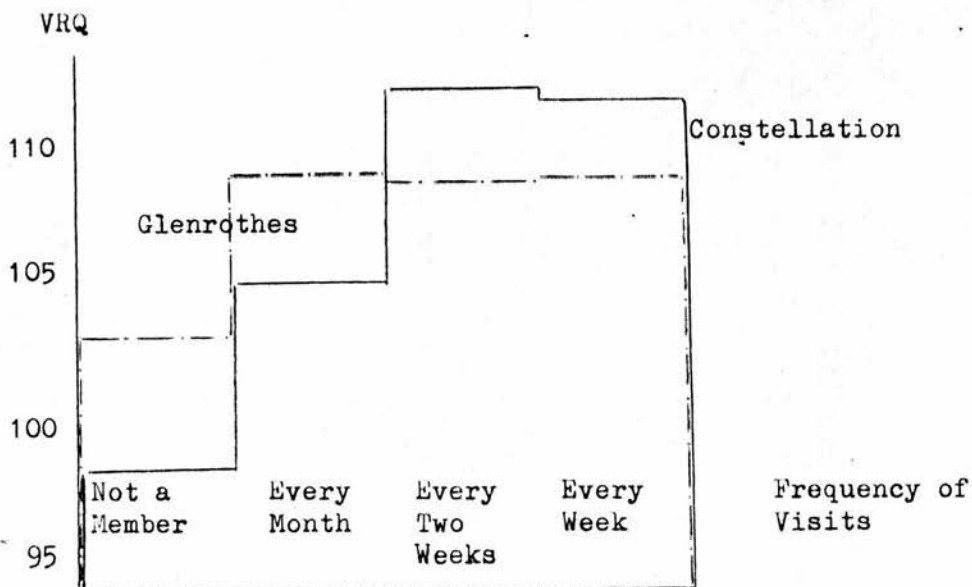
	Average correlation coefficients with verbal reasoning ability	
	<u>Glenrothes</u>	<u>Constellation</u>
Female Average	.1380	.2280
Male Average	.1707	.2475
Overall Average	.1544	.2378

Library Visits and Membership - In both situations, membership associated with higher scores by the children.

36. Husband's frequency of visiting a library - Over 55% of husbands in the Glenrothes sample were members of a library, whereas less than 30% were in the Constellation. 15% in Glenrothes visited every week compared with 5% in the Constellation.



37. Wife's frequency of visiting a library - Similar proportions apply to the wives as to the husbands. 56% of the Glenrothes sample were members, and over 20% visited every week, compared with 45% and 5% respectively.



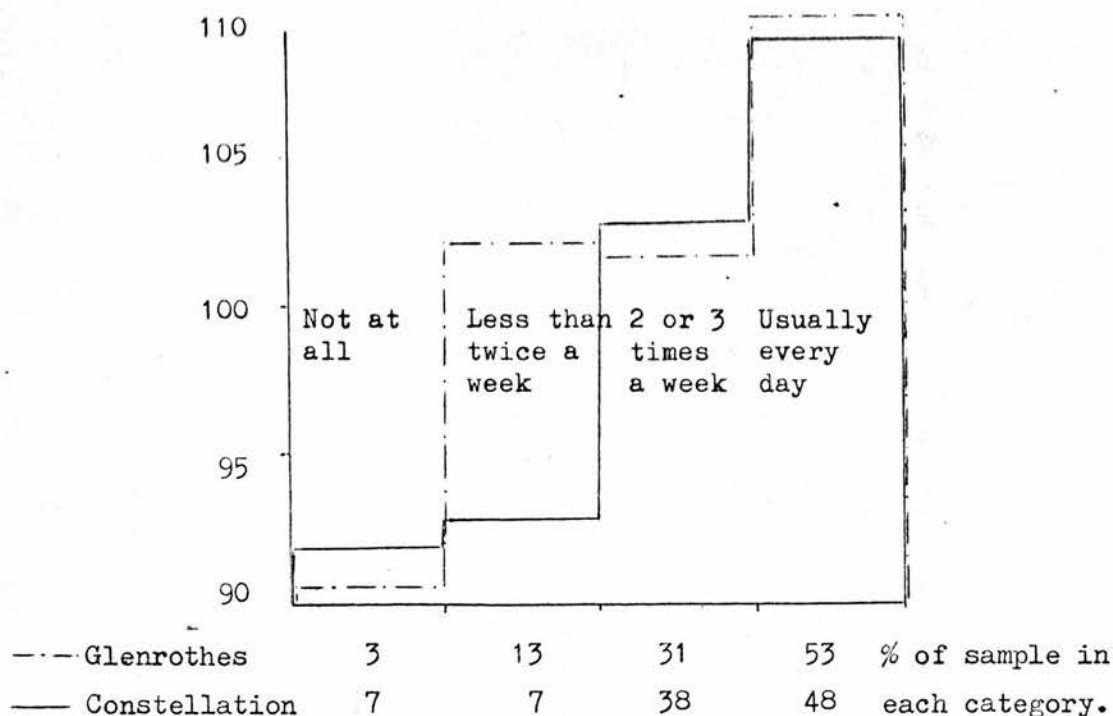
In both situations more women were members of a library or visited a library regularly in comparison to the men. In both situations and for both sexes on seven out of eight tests, children of library members scored higher. The advantage tended to be larger for children in the Constellation.

38. Frequency of Child's Reading at Home - Both areas evidenced positive correlations between this variable and the attainment scores. The average coefficients were .1786 and .1270 for Glenrothes and the Constellation respectively. On both tests of verbal reasoning ability these coefficients were significant at the .01 level. The coefficients are set out below.

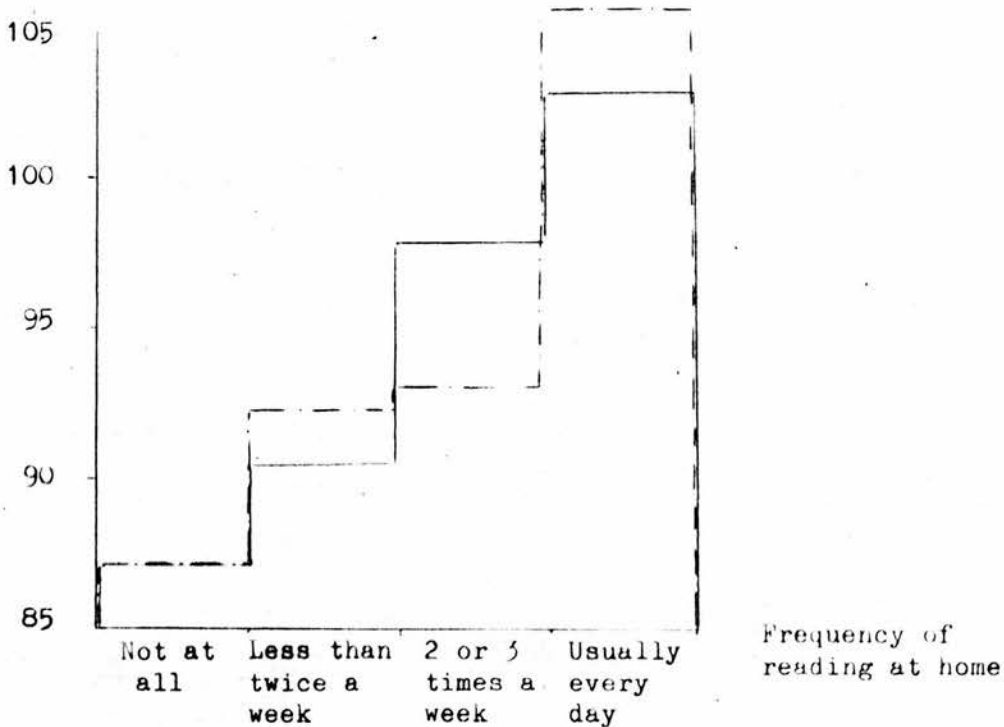
	<u>Verbal Reasoning Quotients</u>	
	<u>1973</u>	<u>1974</u>
Glenrothes	.3184	.3225
Constellation	.3510	.3066

The histograms demonstrate the differences between the areas better than the correlation coefficients.

Verbal Reasoning Quotient '73



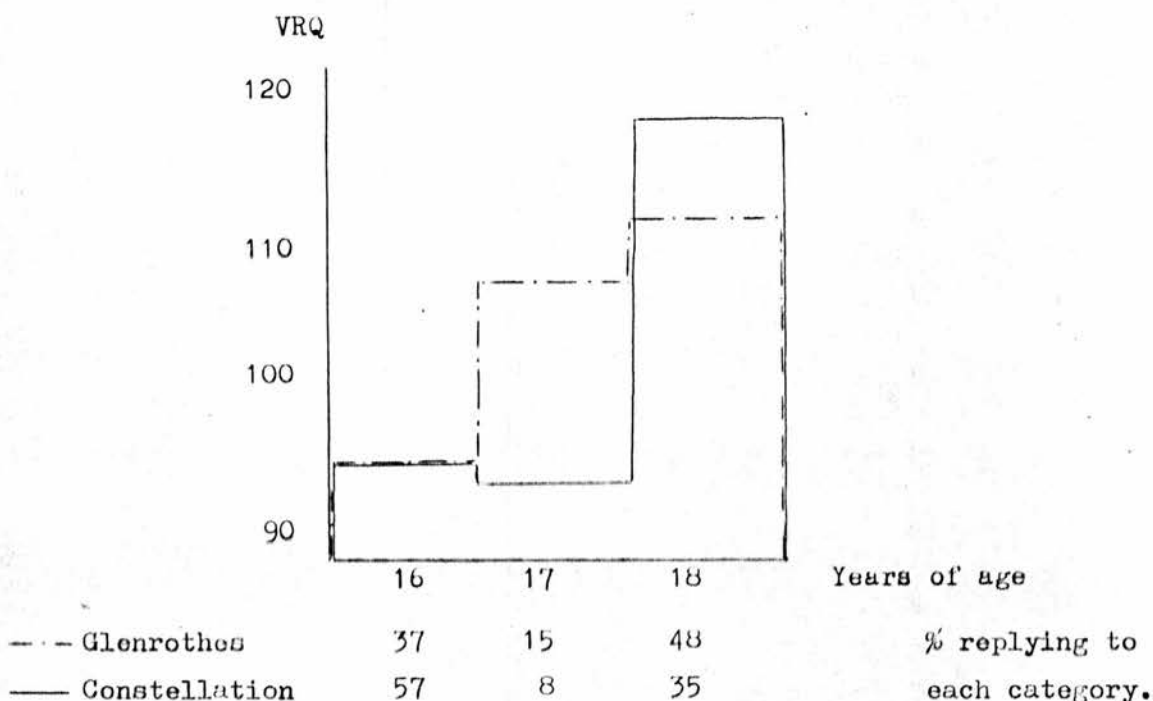
Verbal Reasoning Quotient '74



39 and 40. A Disabled Husband or Wife - Of the nine replies indicating a disabled father, seven were in Glenrothes and two not. Of the six indicating a disabled mother, four were and two were not. In all these cases disablement was associated with lower scores than average.

41. Expected School Leaving Age of the Child - This correlated significantly on all tests in both areas, the coefficients in the Constellation were slightly larger.

41. Child's Expected School Leaving Age.



A Comparison of Correlation Coefficients between attainment scores and expected school leaving ages for the two areas

Test		Glenrothes	Constellation	Difference
Picture Intelligence	'69	.4013	.4890	.0877
Picture Intelligence	'70	.4403	.7068	.2665
Reading	'69	.2980	.6079	.3099
Reading	'70	.3932	.3766	-.0166
Mathematics	'69	.4005	.2760	-.1245
Mathematics	'70	.4864	.1121	-.3743
Verbal Reasoning	'73	.5048	.6683	+.1635
Verbal Reasoning	'74	.5000	.6960	.1960
Average				.0635

No. of School Visits made in past year by the Parents

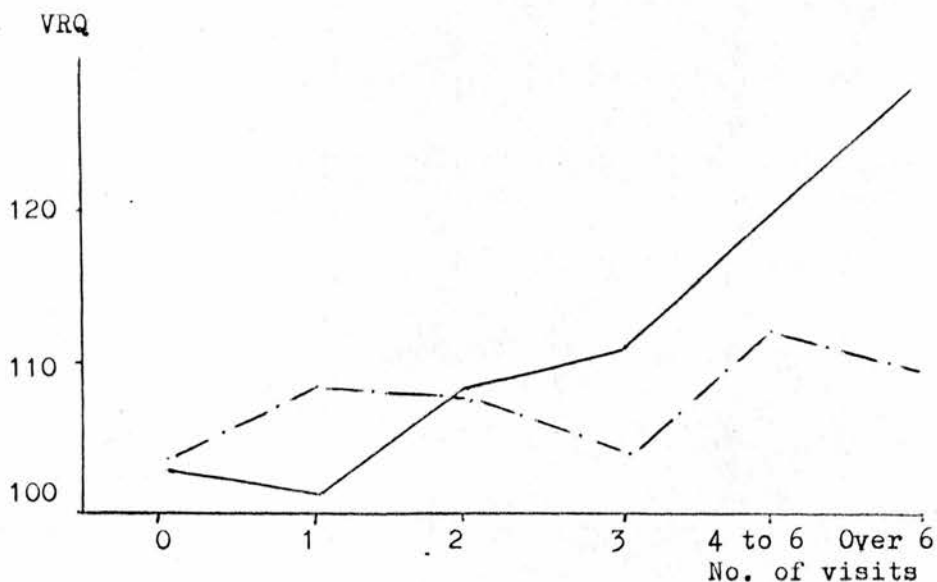
42. No. of School Visits made in past year by Husband - A small positive correlation was found overall with attainment, in both areas, .0111 and .0455 for Glenrothes and the Constellation respectively, however in each case a number of the coefficients were negative, four and three respectively. The only significant differences were between

those husbands who did not visit and those who did, and this was the case for both areas.

43. No. of School Visits made in past year by Wife - In both areas, a small negative correlation was found between attainment scores and maternal visits to the school. This was considerably larger in Glenrothes (.1523 with all eight constituents positive.)

Children of those who either did not visit or visited more than six times a year, performed lowest on the attainment tests.

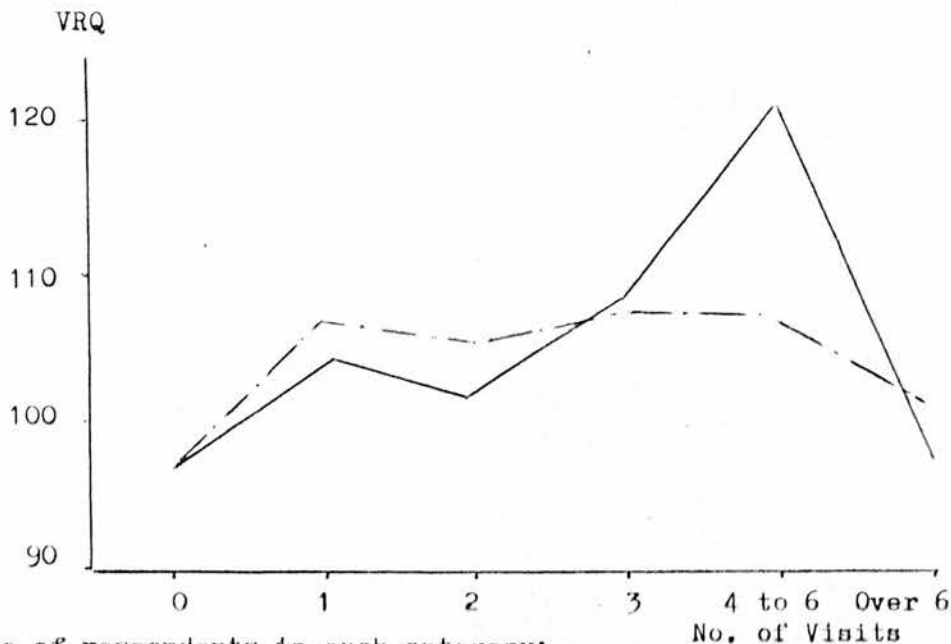
42. No. of School Visits made by husband and V.R.Q. of child



Percentage of respondents in each category

— — —	Glenrothes	23.5	29.3	29.3	12.0	4.0	1.8
—	Constellation	35.4	25.0	27.1	8.3	0	4.2

43. No. of School Visits made by wife and V.R.Q. of child



Percentage of respondents in each category:

Glenrothes	4.2	21.5	32.9	20.2	17.5	3.6
Constellation	3.1	33.8	30.8	12.3	7.7	12.3

44. Husband: A visit to the school without an invitation

In the case of Glenrothes, an uninvited paternal visit to the school was not associated with a score very much different from average, on four tests it was associated with a slightly higher score, and on four a slightly lower score. The verbal reasoning average quotients were 104.760 and 104.971 for the nonvisiting and visiting groups respectively.

However in the Constellation, it was associated with a higher score on seven of the eight tests. The quotient advantage on verbal reasoning being about 10 points. 17% of Glenrothes fathers had so visited, and 13% of Constellation fathers.

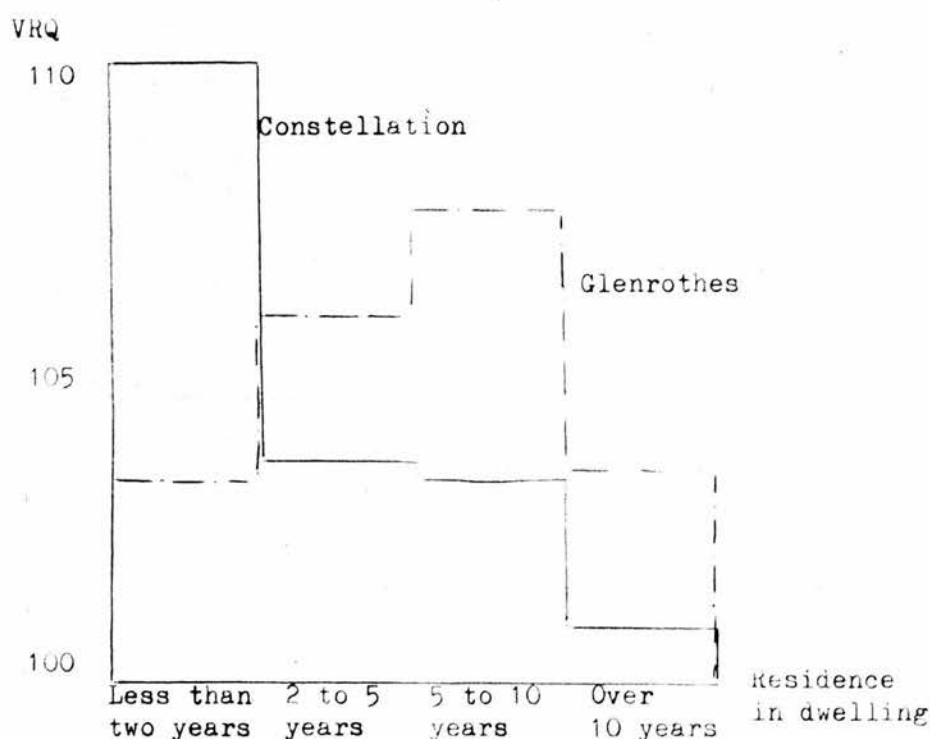
45. Wife: A visit to the school without an invitation

In the case of Glenrothes this was associated with a lower score on seven of the eight tests.

The V.R.Q. deficit was 4.75 points. However in the Constellation group, those visiting uninvited had children who scored higher in five out of the eight tests, although not in either of the verbal reasoning tests. Here the deficit was 3.00 points. Some 4% and 43% of mothers in Glenrothes and the Constellation respectively, had visited the school uninvited.

48. School Textbooks Bought - In both areas those buying textbooks for their children, had children with lower scores on five out of the eight tests. In no cases were any of these differences significant (none of the probabilities reached the 0.10 level).
49. Satisfaction with child's progress - 10% of parents in Glenrothes expressed dissatisfaction with their child's progress, whereas 13% of those who were resident in the Constellation did so. In Glenrothes this was associated with lower scores than average on all eight tests, with an average V.R.Q. deficit of 8 points. In the Constellation this was also associated with a below average score on six of the eight tests and an average V.R.Q. deficit of 5 points.
50. Satisfaction with the school - 9% of Glenrothes and 10% of Constellation parents expressed dissatisfaction with the schools their children attended. In neither case was there any significant difference in the attainment scores from the average for each area.
51. Work Status of husband - Twelve of the thirteen unemployed were in the Glenrothes sample, so no statistically relevant comparisons could be made. The average verbal reasoning quotient of the Glenrothes children unemployed was 89.083 and the one quotient for the Constellation was 89.000.

52. Work Status of Wife - Neither group demonstrated any significant differences between housewives, part-time employees and full time employees.
53. Social Class - In both situations there were significant negative correlations with attainment averaging at 0.1965 and 0.2222 for Glenrothes and the Constellation respectively.
54. Wife's Occupation - Classified by social class, this correlated with attainment at average of 0.2119 and 0.3446 in Glenrothes and the Constellation respectively, a considerably larger coefficient for residents of the Constellation.
55. Length of Residence in Present Dwelling - In both places there were overall negative correlations with attainment criteria, .1299 and .2245 for Glenrothes and the Constellation respectively. However, whereas all eight Constellation coefficients were negative, three of those for Glenrothes were positive, including both verbal reasoning tests. The histogram demonstrates the differences between the areas.
55. Length of Residence in Present Dwelling and V.R.Q. of child



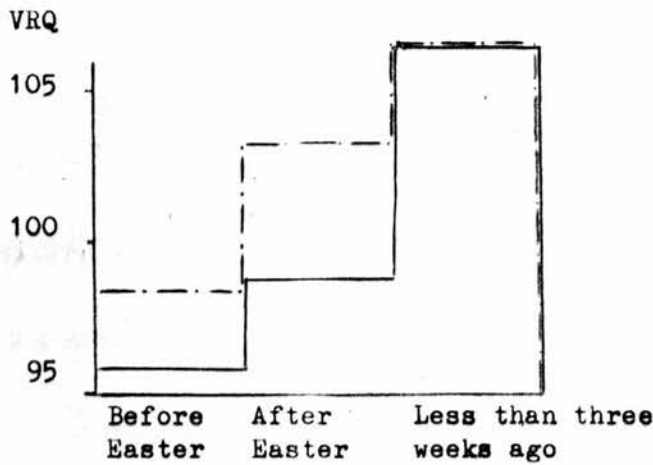
56. Length of Residence in Present Locality

See Chapter Ten.

57. Reason given for Last Move

See Chapter Nine.

58. Frequency of Family Outings.



Percentage in each category:

--Glenrothes	6	18	77
—Constellation	10	17	73

In Glenrothes, frequency of family outings correlates at the .05 level with attainment on three tests, these are given below . In each case the correlation coefficient in the Constellation is larger.

<u>Test</u>		<u>Glenrothes</u>	<u>Constellation</u>
Picture Intelligence	'69	.1894	.2194
Verbal Reasoning	'73	.1302	.2732
Verbal Reasoning	'74	.1129	.2519

59. Frequency of Contact with Relatives - The average correlation coefficients with attainment differed by only 0.026 between Glenrothes and the Constellation.

60-65. Membership of Organisations

60. Membership of any organisation : husband - In both situations

this was associated with a slighter higher score on the attainment tests. In only one test did this reach a level of statistical significance, for both areas.

61. Membership of any organisation : wife - In both areas this was

also associated with a higher score on the attainment tests. On both tests of verbal reasoning this reached the .05 level of significance in both areas. The advantages being approximately three and ten points in V.R.Q. for the New Town and the Constellation respectively.

62. No. of organisations a member : husband - This correlated with

attainment positively on seven out of the eight tests in both Glenrothes and the Constellation. In four cases this reached the .05 level of significance. They were:

<u>Test</u>	<u>Picture Intelligence</u>	<u>Mathematics</u>	<u>Verbal Reasoning</u>	
	'69	'69	'73	'74
Glenrothes	.2095	.2310	.1818	.1835
Constellation	.2539	.0392	.2595	.2519

Three of the four show a larger correlation coefficient in the Constellation.

63. No. of Organisations a member - wife - The male situation was

almost exactly replicated here with Constellation coefficients being slightly larger.

<u>Test</u>	<u>Picture Intelligence</u>	<u>Reading</u>	<u>Verbal Reasoning</u>	
	'69	'69	'73	'74
Glenrothes	.2501	.2762	.2342	.2074
Constellation	.3430	.1152	.3169	.3187

64. Trade Union membership : husband - In both areas this was associated with a higher score on all eight tests, two being significant for this at the .05 level; 15 and 16. The advantages here were four and nine points in V.R.Q., for Glenrothes and the Constellation respectively.
65. Trade Union membership : wife - This is also associated with higher scores on the tests, None of the differences reached significance in the New Town, whereas one did in the Constellation, on the '74 test of V.R.Q., in this case being associated with a nine point advantage for the children of members. (cf 1.3 points in Glenrothes.) However only 14% of Constellation wives signified such membership, whereas 19% of those in Glenrothes did so.
66. Main Locus of Leisure Time Activity - In Glenrothes, whether or not the centre of leisure activity was inside the home was not associated with higher or lower scores. Five tests showed one way and three the other, the V.R.Q. difference was .2 points. In the Constellation, a centre of activity outside the home was associated with a higher score, but this was not significant on any test (the level of .10 probability was not reached for any of the eight criteria)
67. Degree of Contact with Neighbours - 55.5% of Glenrothes respondents had visited a neighbour in their home, whereas 49.2% of Constellation respondents had. In both situations this was associated with higher attainment scores. However in the case of Glenrothes this advantage was 1.905 points in V.R.Q., but was 6.524 points in the case of the Constellation. In this respect the two areas were different at a .001 level.

68. Family Size - This correlated at the .05 level of probability with scores on three tests in the Glenrothes sample those of 1970 and verbal reasoning in 1973 and '74, but with four in the Constellation sample, those of mathematics and reading in 1970 and verbal reasoning in 1973 and 74. The average coefficients for these four tests were - 0.1171 for Glenrothes and - 0.3274 for the Constellation, the latter being considerably larger.
69. Birth Order - In both situations, only with scores on the tests of verbal reasoning did coefficients become significant at the -0.1018 and - 0.2550 for Glenrothes and the Constellation respectively.
70. Disrupted Family - 18% of Glenrothes residents indicated this and 17% of those in the Constellation did also. On all tests in both areas this was associated with a lower score. This deficit was significant at the .001 level on the tests of verbal reasoning in both areas. In Glenrothes the deficit was between seven and eight points of V.R.Q, and in the Constellation it was between 15 and 16 points.

Appendix IV

Differences between Various Groups on
Several Indicators

Table IV.1.

Correlation Coefficients between Various Indicators and Social Class,

Where the Coefficient was Significant in either of the Two Areas

(A negative coefficient indicates, increasing tendency
toward Social Class V)

	<u>Glenrothes</u>	<u>Constellation</u>	<u>Difference</u>
Frequency of visiting a library : husband	-0.2560 (.001)	-0.1978 (.133)	-.0582
Frequency of visiting a library : wife	-0.1873 (.001)	-0.2452 (.061)	.0579
Expected school leaving age of child	-0.3630 (.001)	-0.5950 (.001)	.2320
No. of visits to the school in one year : husband	-0.3630 (.001)	-0.5950 (.001)	.3145
* No. of visits to the school in one year : wife	-0.1196 (.036)	+0.0533 (.644)	.1779
Wife's occupation	+0.1343 (.016)	+0.2832 (.017)	.1489
Frequency of contact with relatives	-0.1645	-0.2534	.0889
Family size	+0.0382	+0.1893	.1511

* In this case, the number of visits to the school increased down the social scale for the New Town, but, up it for the Constellation, (the latter was the expected direction, drawn from the evidence of several surveys, e.g. Appendix 10 of the Plowden Report tables 75 and 76)

Figures in brackets are the probabilities of such coefficients occurring by chance.

Table IV. 2.

Differences in the variance between classes on various indicators of parental attitudes and family characteristics

Indicators for which variance less within the New Town

Wife's frequency of visiting a library

Frequency of child's reading at home

Expected school leaving age of child

No. of visits to the school in one year : Husband

No. of visits to the school in one year : Wife.

Visited school uninvited : husband
Visited school uninvited : wife
Frequency of help with schoolwork : husband
Frequency of help with schoolwork : wife
Textbooks bought
Satisfaction with child's progress at school
Satisfaction with the school
Frequency of family outings
Frequency of contact with relatives
No. of organisations joined : husband
No. of organisations joined : wife
Membership of a trade union : husband
Membership of a trade union : wife
Locus of leisure activity
Family size
Disrupted family

Indicators for which variance less in the Constellation

Husband's frequency of visiting a library
Wife's occupation
Frequency of contact with neighbours.

Table IV.3.

Differences between two groups, the first possessing all the home amenities, including central heating and a telephone, and the second lacking one or more of these amenities. A comparison for Glenrothes and the Constellation

	<u>Difference between the two groups, on the indicator specified</u>	
	<u>Glenrothes</u>	<u>Constellation</u>
'69 Picture Intelligence Score.	3.2	16.3
'70 Picture Intelligence Score.	10.4	15.1
'69 Reading Score.	0.0	3.1
'70 Reading Score.	2.5	6.3
'69 Mathematics Score.	5.4	22.4
'70 Mathematics Score.	3.0	5.2
'73 Verbal Reasoning Quotient.	5.0	14.9
'74 Verbal Reasoning Quotient.	4.7	15.6
% Absence.	0.6	- 2.1
Percent of families owning their own house	23.1	47.0
No. of rooms.	0.5	1.2
House built since 1960 %	30.3	32.3
School leaving age : husband (yrs)	0.47	0.62
School leaving age : wife (yrs)	0.33	0.39
No. of education courses : husband.	0.36	1.15
No. of education courses : wife.	0.40	1.03.
Percent of husbands being members of a library	6.0	11.8
Percent of wives being members of a library	15.3	5.3
Frequency of child's reading at home	0.28	1.0
Percent of husbands having visited the school.	1.6	21.4
Percent of husbands having visited the school uninvited.	6.3	6.4
Percent satisfied with child's progress at school	1.0	6.5
Social Class (index difference)	0.95	1.24
Percent of families having an outing with last three weeks.	.0	21.3
Percent of families seeing relatives less frequently than once a month.	5.4	29.7

	<u>Glenrothes</u>	<u>Constellation</u>
Percent of husbands being members of an organisation.	1.7	15.3
Percent of wives being members of an organisation.	12.1	3.8
Percent of husbands being members of a trade union.	0.6	10.8
Percent of wives being members of a trade union.	18.6	21.7
Percent having visited their neighbours in their homes.	8.5	12.2
Family size.	0.36	0.38
Disrupted families, percent.	10.4	19.4

Table IV. 4.

A Comparison of the groups in the New Town giving different reasons for their last move, on various indicators gained from the questionnaire

Characteristic	Reasons given for last move			
	A better Job	A better House	A better enviroment	Other Reasons
% Owner occupiers	23.5	23.0	13.5	13.4
Average No. of rooms.	4.51	4.33	4.45	4.30
% Possessing central heating	65.4	44.6	54.1	64.2
% Possessing a telephone.	65.4	60.4	56.8	56.7
% Living in a dwelling built since 1960	78.7	59.4	67.6	65.7
Husband's school leaving age.	15.18	15.00	14.96	15.10
Wife's school leaving age.	15.30	15.02	14.99	15.20
No. of educational courses : husband	2.42	1.93	1.85	2.13
No. of educational courses : wife	1.69	1.26	1.42	1.64
% of husbands members of a library	72.2	43.5	53.7	60.0
% of wives members of a library	72.7	51.5	48.3	61.2
Average No. of visits to a library per month : husband.	2.17	1.26	1.63	1.64
Average No. of visits to a library per month : wife.	2.40	1.55	1.43	1.90
% having had a family outing within the last three weeks.	54.3	56.0	31.1	76.1
Average No. of days elapsing between contact with relatives(index).	21	17	20	19
% of husbands members of an organisation.	75.6	72.3	63.5	61.7
% of wives, members of an organisation.	59.2	60.2	45.6	51.6
Average No. of organisations joined : husband.	1.25	1.14	0.99	0.99
Average No. of organisations joined : wife.	0.74	0.72	0.65	0.79
% of husbands members of a trade union.	43.2	33.7	32.4	22.4
% of wives members of a trade union.	17.3	18.6	25.7	17.9
% having locus of main leisure activities outside the home	71.1	60.0	63.3	73.0

<u>Characteristic</u>	<u>A better</u>	<u>A better</u>	<u>A better</u>	<u>Other</u>
	<u>Job</u>	<u>House</u>	<u>enviroment</u>	<u>Reasons</u>
% having visited their neighbours in their houses.	53.1	56.4	48.6	56.1
Average No. of visits to school in one year : husband	1.44	1.40	1.63	1.71
% of wives having visited the school more than six times or not at all.	7.5	7.2	11.2	7.7
% of husbands visiting the school without an invitation.	15.1	14.0	13.6	32.7
% of husbands helping with schoolwork.	84.9	78.7	90.3	91.2
% of wives helping with schoolwork.	89.6	83.3	86.1	86.2
% having purchased textbooks.	15.6	15.5	15.3	28.8
% of children reading everyday	43.2	55.4	52.7	58.2
Expected school leaving age of child (years)	17.3	16.9	17.1	17.1
% dissatisfied with child's progress	6.2	6.1	15.3	20.0
% dissatisfied with the school	6.2	7.1	11.0	10.6
Index of social class.	3.04	3.64	3.71	3.16
Index of wife's occupation	3.63	4.24	4.57	4.10
Length of residence in present dwelling (years)	6.35	7.68	6.49	5.92
Length of residence in present locality (years)	7.07	10.06	7.05	7.14

Appendix V

The Statistical Tests and their Use

The statistical tests used were all developed from basic probability theory and are constrained by its assumptions and limitations. Of major importance to probability theory is the Central Limit Theorem which enables the inference of the statistical distribution of any quantity which is generated in a certain way. For the Central Limit Theorem to apply, the value in question must be produced as the sum of a number of contributions which can vary independently. The contributions themselves need not be equal, but the amount by which they can vary, as measured for example, by the standard deviation, must be approximately equal and must be large in number. The values of the quantity will be distributed about a mean, \bar{x} , and the probability of a deviation from the mean of a magnitude between x_1 and x_2 is:

$$p(x_1, x_2) = \frac{1}{\sqrt{2\pi}} \int_{x_2}^{x_1} e^{-x^2/2\sigma^2} dx$$

where σ is the standard deviation of the population.

The distribution described by this equation is known as the Normal or Gaussian Distribution, and it approximates to the Binomial Distribution when the number of cases is large. The Binomial Theorem can be used to forecast the probability of all possible outcomes of n trials of any event provided the probability of those outcomes is known. For example, in tossing coins, the probability of heads or tails is a half on each throw, and the probability of any number of heads being thrown (e.g. $m+r$ in $2m$ throws) can be determined from this theorem:

$$p_{m+r} = \frac{2m!}{(m+r)!(m-r)!} \cdot \frac{1}{2^{2m}}$$

It is much more likely for $m+r$ heads to be thrown if r is small than if r is large. When a large number of throws are made there is about a 68% likelihood of the numbers of heads being within one standard deviation of the mean, and about a 5% likelihood of them

being two or more standard deviations from the mean.

"It has been said that the general validity of the normal distribution is accepted by everyone, because the practical scientists believe that it has been justified theoretically, while the theoreticians believe that its universality has been established by experiment."¹ There are many observations, of such things as heights of men or intelligence quotients of schoolchildren, which fit into this normal distribution, when they are arranged in frequency distributions. Quetelet, working on French Census Data in the nineteenth century noted that the heights of French men conformed to "the law of errors, almost as if Nature had been an indifferent marksman aiming at a standard height of, say, 5ft.6ins."²

The normal distribution enables predictions to be made as to the probability of certain events occurring by chance, on a large variety of phenomena, provided certain basic parameters are known (e.g. provided the mean, say, 100 and standard deviation, say 15, of I.Q. on a group of children is known), it is possible to determine the likelihood of selecting by chance a group of children of mean I.Q. 105 or standard deviation 12 from the parent population. If the parent population numbers 1,000 and the group 200 this chance is very low (below 5%) and inferences as to possible reasons for this difference (e.g. the group may be of one social class) may be drawn.

This method of determining whether or not a result could easily occur by chance lies at the base of all the tests used, whether they were used on characteristics which were normally distributed, e.g. attainment quotients, (parametric tests) or not, e.g. reasons for moving, (non-parametric tests).

As this research has dealt with finite samples, and sometimes not very large samples, probability functions other than that of the normal distribution have been appropriate.

The t distribution and the t test.

When samples are taken, their characteristics may be simply described with regard to mean, standard deviation, etc., but it is not possible to

know to what degree they are representative of their parent populations, although limits of confidence may be established through the formulation of standard errors of various characteristics. W.S.Gosset developed a distribution which was dependent only on the sample sizes, and it is known as the t distribution.

This is used to determine whether or not differences between means of samples are likely to occur by chance. If the latter is the case, (the 5% likelihood of occurrence by chance was the level used throughout this research) then the differences may be said to be significant.

If the mean I.Q. of one group (e.g. the Glenrothes children) is \bar{x}_1 , and of the other group (e.g. the Constellation Children) is \bar{x}_2 ,

$$\bar{x}_1 = \frac{1}{n_1} \sum_{i=1}^{n_1} x_1$$

$$\bar{x}_2 = \frac{1}{n_2} \sum_{i=1}^{n_2} x_2$$

where n_1 and n_2 are the numbers in the Glenrothes and Constellation groups respectively.

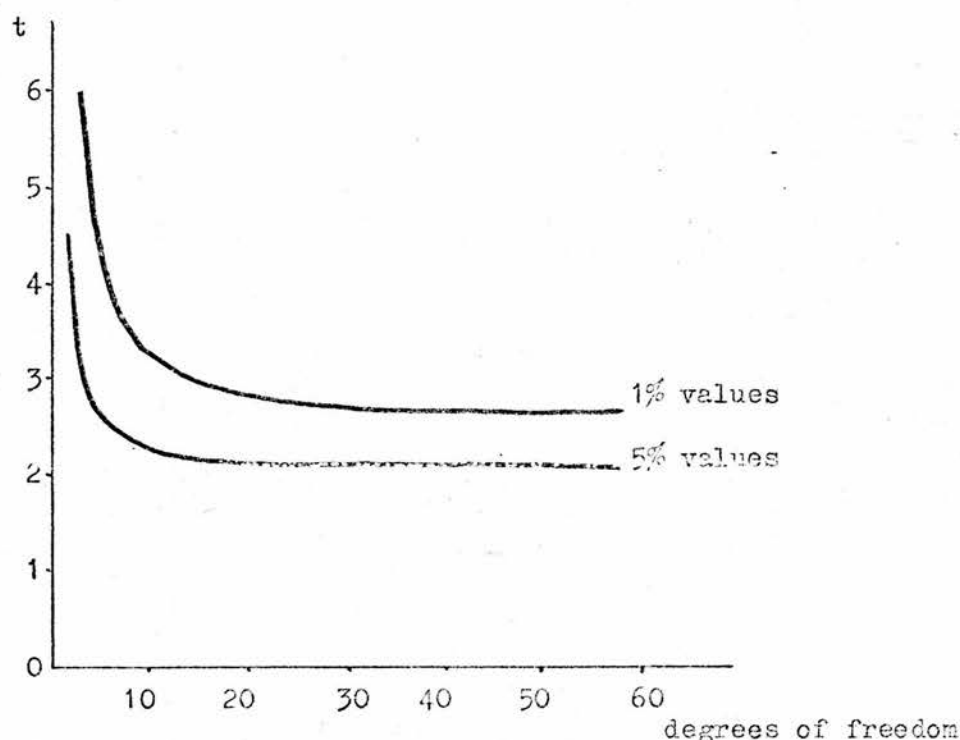
Their respective standard deviations will be:

$$\sigma_{x_1} = \sqrt{\frac{1}{n_1 - 1} \sum_{i=1}^{n_1} (x_1 - \bar{x}_1)^2}$$

$$\sigma_{x_2} = \sqrt{\frac{1}{n_2 - 1} \sum_{i=1}^{n_2} (x_2 - \bar{x}_2)^2}$$

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\sigma_{x_2}^2 + \sigma_{x_1}^2}}$$

When the sample sizes are large the t distribution approximates to the normal distribution with unit standard deviation, and like the normal distribution it can not be integrated by algebraic methods, but only by numeric ones. This has been done for values of practical interest, thus providing levels of chance for various results.

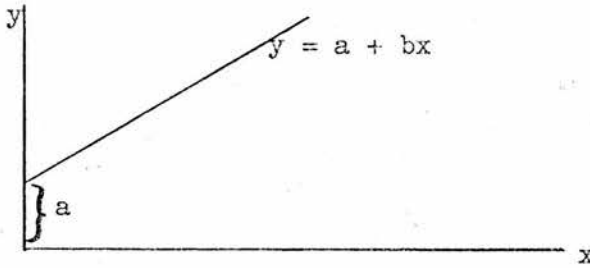


The determination of the probability of a difference from the t table depends upon the number of degrees of freedom involved, which equals the number of measurements (the sum of the sample sizes) minus the number of independent statistics already calculated therefrom, two (the means) in this case . The t distribution can also be used in estimating confidence limits in situations other than differences in means, such as correlation analysis.

The main assumptions of this test are the approximately normal distribution of the data and independent random sampling.

Correlation

Correlation is a specific case of regression analysis , when two interval scales are compared and a linear relationship is assumed between them, e.g. between V.R.Q. and length of education, Correlation analysis yields a particular correlation coefficient (r) which indicates the degree to which two variables (x and y) are associated.



However the data dealt with was not confined to a straight line but was scattered, and correlation analysis was used to discern if any relationship existed between the two variables, and so had to take account of the scattering .

If y_i and x_i refer to the scores of the individual , the relationship may be represented as follows :

$$y_i = a + bx_i + e_i$$

where e_i represents the disturbance due to the points being distributed around the straight line but not on it. If the disturbance is random then the sum value of the disturbance term can be assumed to be zero, and that the disturbance will be independent of either of the variables under consideration. This latter assumption is one of homoscedasticity , i.e. the variance of all the individual disturbance terms is constant across all levels of x , and together with the assumption of normality is necessary for the establishment of confidence limits. The crucial assumption in regression analysis is that x is independent of the error term.

In determining the line of best fit between two variables to describe

the relationship between them , it is necessary to determine the line which involves the least squared distances from the individual points to it . However this line only describes the form of the relationship but not its strength. In order to do this both a coefficient and levels of confidence are required.

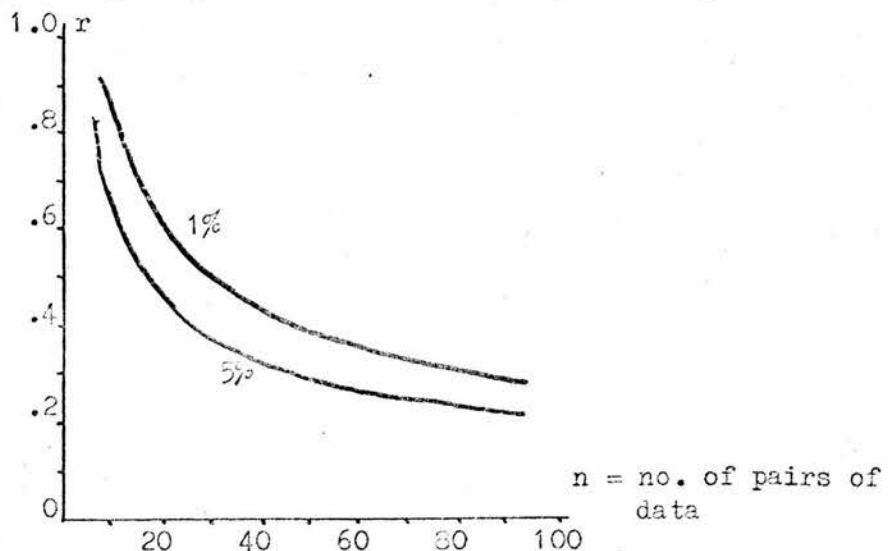
Pearson's Product Moment Correlation was used in the analysis and generates a correlation coefficient , which like all other coefficients can vary from +1 to -1. It is determined by the ratio of the covariation to the square root of the product of the variation in x and the variation in y, and can be defined as the ratio of the covariance to the product of the standard deviations of x and y.

$$r = \frac{\sum xy}{(\sum x^2)(\sum y^2)}$$

Confidence limits for a coefficient can be determined by converting it into a z statistic or a t statistic :

$$z = \frac{1}{2} \ln \frac{1+r}{1-r} \quad \text{or} \quad t = \frac{r(\sqrt{n-1})}{\sqrt{1-r^2}}$$

The value of z runs from $-\infty$ to $+\infty$ as r runs from -1 to +1 and for all values its distribution is approximately normal, with variance $1/(n-3)$, where n pairs of data are used in calculating r.



However when both sets of data being compared are not interval data , the Pearson method is not appropriate.

Rank Order Correlation

In appendix one Social Classes were ranked from one to six , but the numbers do not represent equal intervals ; the intervals between Social Classes I and II and between Social Classes IV and V can not be equated in the same way as those between one and two years residence and between four and five years residence. Nevertheless they represent differences in one direction ,but on an ordinal scale. Although the Pearson method is inappropriate for such a scale , rank order methods can be used. As the concept of linearity is inapplicable , such methods assume only that the relationship being investigated is either monotonic increasing or monotonic decreasing, i.e. it keeps going in one direction, either upwards or downwards.

Two methods of rank order correlation were used in this work ; those of Spearman and Kendall, both of which involve ranking the data although in different ways. These methods were also used between two sets of interval data when the number of cases was small and the normal distribution of the variables could not be assumed , e.g. when dealing schools or precincts.

Spearman's method compares ranks on the two sets of data by taking the differences in the ranks ,squaring them and then adding , and finally manipulating the measure so that its value will be + 1.0 whenever the ranks are in perfect agreement , - 1.0 if they are in perfect disagreement.

$$r = 1 - \frac{\sum_{i=1}^n d^2}{n(n^2 - 1)}$$

where d is the difference between any pair of ranks and n is the number of pairs.

In order to test for significance :

$$t = \frac{r (\sqrt{n - 2})}{\sqrt{1 - r^2}}$$

where the degrees of freedom equal the number of pairs of data minus two.

Kendall's method compares the number of pairs of data ranked in the same order on each axis with those ranked in a different order :

$$r = \frac{c - d}{\frac{1}{2}n(n - 1)}$$

where c equals the number of concordant pairs and d equals the number of discordant pairs ,and n equals the number of pairs.

In both cases , corrections for ties in ranking can be introduced .

Multiple Regression

This is an extension of the regression techniques noted under correlation , with the same assumptions.Using stepwise multiple regression analysis , a regression coefficient is produced which represents the degree of association of the dependent variable (e.g. attainment) with the sum of several independent variables. In this procedure the first regression coefficient produced is equivalent to a simple correlation coefficient between a dependent and an independent variable , the second is the result of adding to the first coefficient any further association between the dependent variable and a second independent variable not accounted for in the first regression coefficient . This procedure can be continued to three, four and more independent variables.

The coefficients between two variables obtained in multiple regression are obtained by controlling for each of the remaining independent variables considered in the regression equation. This is in contrast to the case of

simple correlation between two variables where the coefficient is obtained by ignoring the other variables.

Partial Correlation

This procedure enables the measurement of the relationship between a dependent variable , e.g. attainment, and an independent variable , e.g. length of residence in Glenrothes , controlling for one or more independent variables , e.g. length of education and family size. This procedure is used in multiple regression analysis to obtain coefficients. In correlating two variables, an error factor has to be taken account of in determining confidence limits. This error factor or residual results from deviations of individual points from the least squares equation between , say, attainment and length of education. It includes deviations resulting from other factors such as birth order, family size and social class. In correlating this residual , the control is achieved. The partial correlation between , say, attainment and length of education , controlling for family size can be defined as the correlation between the residuals of the regressions of attainment on family size and length of education on family size. In this way part of the residual in the correlation between attainment and length of education is explained and the error term reduced.

Partial correlation can be achieved by product moment and rank order methods :

$$r_{xy,z} = \frac{r_{xy} - (r_{xz})(r_{yz})}{\sqrt{1 - r_{xz}^2} \sqrt{1 - r_{yz}^2}}$$

where x and y are the variables to be correlated and z is the variable to be controlled for.

The Chi Squared Distribution

The chi squared distribution is used to evaluate the Test of Goodness of Fit. This test is non-parametric and assumes only that independent random samples have been used , that Stirling's approximation to the factorial can be used and that the number of cases exceeds a minimum of five per cell. It is used to determine whether the frequency of events falling into certain categories is significantly similar or dissimilar given certain different conditions. It was used to determine whether or not the frequencies of parents giving different reasons for their last move were dissimilar depending upon whether their last move was to the New Town , within the New Town or in the Constellation. A null hypothesis was drawn up and expected frequencies for each situation based upon it.

$$\text{Chi Squared} = \sum \frac{(O - E)^2}{E}$$

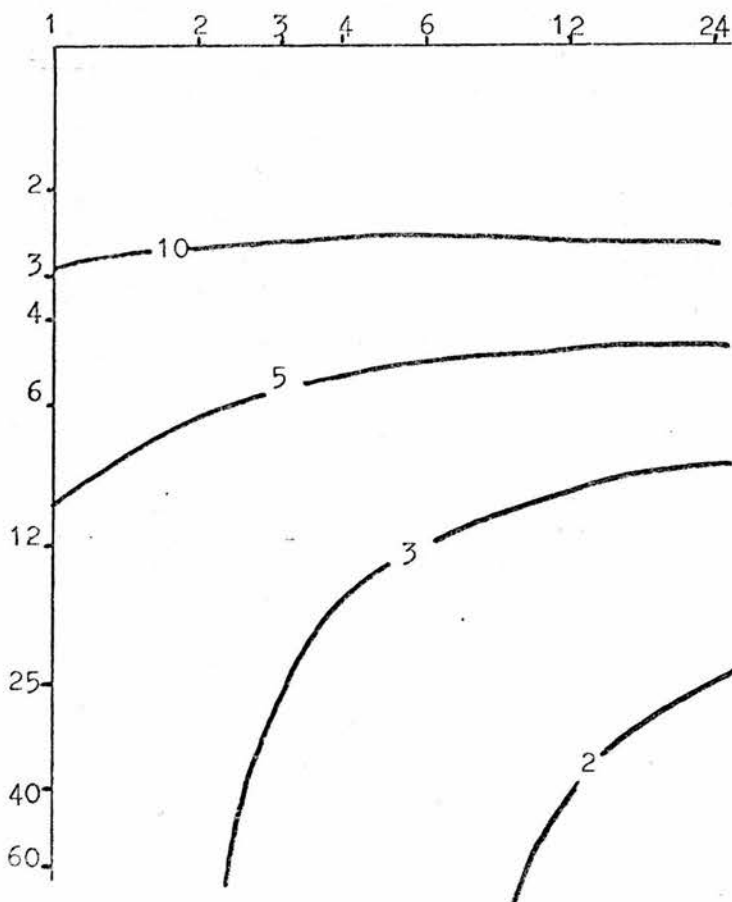
where O is the observed frequency in each category (e.g. the four categories in the above example) and E is the expected frequency in each category based on the hypothesis being tested.

The chi squared statistic is evaluated from the Chi Squared distribution once the number of degrees of freedom have been ascertained, which is easily done by subtracting one from each of the numbers of rows and columns involved and multiplying the resulting two figures.

The Chi Squared Distribution represents the sum of squares of n items drawn at random from a normal distribution of zero mean and unit standard deviation. The distribution depends on the number of items but unless the number is too small, as specified above , the statistic derived from the above equation will fit into this distribution.

The F Test

This test can be used to determine if the distributions or variances of two groups of measurements are significantly dissimilar. This test was used to determine whether or not the distribution of educational attainment was significantly different in Glenrothes and the Constellation. As noted above, the sum of squares of a number of items drawn from a normal distribution will fit into the Chi Squared Distribution. In taking the ratio of two such sums of squares, the F or variance ratio is obtained. Snedecor formulated this statistic and tabulated the main percentiles of its distribution for various combinations of the degrees of freedom of the two chi squared values. In the graph below the number of degrees of freedom of the larger estimate is used as x co-ordinate and that of the smaller as y co-ordinate. The contours represent F values at the 5% level.



The F test makes assumptions with regard to independent random samples and the normality of the distributions of the variable .

Analysis of Variance

Analysis of variance enables the total variation in a set of data to be reduced to components associated with possible sources of variability whose relative importance can be assessed . This method of analysis was used to determine the importance of social class , reason for last move , school and neighbourhood, in accounting for attainment differences. It is in many ways an extension of the difference of means test and involves the same assumptions but works directly with variances rather than means and standard errors . It is necessary to define categories, e.g. the six Social Classes , or the four reasons for the last move, and work out the mean score for each of the classes as well as for the entire sample. For each case :

$$\left\{ \begin{array}{cc} \text{Individual} & - \text{Grand} \\ \text{Score} & \text{Mean} \end{array} \right\} = \left\{ \begin{array}{cc} \text{Individual} & - \text{Category} \\ \text{Score} & \text{Mean} \end{array} \right\} + \left\{ \begin{array}{cc} \text{Category} & - \text{Grand} \\ \text{Mean} & \text{Mean} \end{array} \right\}$$

In squaring and summing for all the cases :

$$\left\{ \begin{array}{c} \text{Total Sum of Squares} \end{array} \right\} = \left\{ \begin{array}{c} \text{Within Groups} \\ \text{Sum of Squares} \end{array} \right\} + \left\{ \begin{array}{c} \text{Between Groups} \\ \text{Sum of Squares} \end{array} \right\}$$

$$\left\{ \begin{array}{c} \text{Total degrees of} \\ \text{freedom (n - 1)} \end{array} \right\} = \left\{ \begin{array}{c} \text{Within Groups} \\ \text{degrees of freedom} \\ (n - k) \end{array} \right\} + \left\{ \begin{array}{c} \text{Between Groups} \\ \text{degrees of freedom} \\ (k - 1) \end{array} \right\}$$

where k equals the number of groups or categories.

The estimates of variance are then :

$$\text{Within Groups} = \text{Sum of Squares} / n - k$$

$$\text{Between Groups} = \text{Sum of Squares} / k - 1$$

The F test can be used to determine if these two estimates differ significantly. This can be used to determine whether or not the categories or conditions used have had a significant effect upon the sample.

Two way analysis of variance can be used to compare groups which are subject to two or more conditions. However these conditions have to be independent of one another , a fact which did not apply when considering the data with regard to Social Class , length of residence, or reason for last move, all of which were inter-related.

The Use of the Tests in the Scheme of Analysis

Chapter Seven : In chapter seven , the first hypothesis was investigated: "The level of attainment of children in a New Town will be higher than that of a socio-economically comparable population."

In order to falsify or corroborate this hypothesis , it was necessary to compare the average scores of the two sample populations. The normal distribution of attainment scores rendered the t-test the most appropriate statistical test for this purpose. The data revealed similar standard deviations for the two samples and all the tests had adequate sample sizes for this test thus fulfilling the conditions necessary for its use.

It was also necessary to ensure that the two populations were socio-economically comparable. To this end the scores of children of manual and nonmanual workers were compared using the t-test. It was not possible to use individual social classes as the sample sizes were too small for the moderate differences noted to be statistically significant.

Social Class also ~~was~~ controlled for by allocating the mean scores for each Social Class to all the children in each Social Class and then comparing the resulting means of the two groups, thus giving the difference in attainment resulting from Social Class. The difference between the two groups was then added or subtracted as appropriate from the difference between their proper means. (If the New Town children's proper mean score was higher than that of the Constellation children and the Social Class difference was also in the New Town's favour, the latter was subtracted from the difference, if not it was added). The resulting difference in scores was the difference in educational attainment between the two groups controlling for Social Class.

The corroboration of the first hypothesis led to an investigation of the indicators of educational attainment as revealed in the questionnaire returns. Chi squared was the most used statistical test in determining

differences between the areas, because it relies upon no assumptions about the distribution of the data. In a few cases it was appropriate to use the t test , modified for differing standard deviations.

Chapter Eight: In chapter eight the second hypothesis was investigated: "Differences in the level of educational attainment between Social Classes will be smaller in the New Town than in a comparable population."

The technique first used to evaluate this hypothesis was analysis of variance. The assumptions of this test are the same as of the t test, namely normality, independent random samples and similar population standard deviations. This latter assumption was the most difficult to maintain when analysing various test scores, especially with small sample sizes, but in the majority of test scores evaluated, was well enough met. The variance in educational attainment within Social Classes and between them could then be calculated and the variances in the two areas compared using Snedecor's F test. This test enabled significant differences in the variances in attainment between the two areas to be discerned, both between Social Classes and within them. As variance is a measure of dispersion, it was therefore possible to conclude whether or not Social Class differences in attainment were greater in the Constellation than in the New Town.

T tests were also used for this purpose but when groups other than manual and non-manual workers were compared, sample sizes were at the minimum level necessary for the test to be useful. Multiple regression analysis was also used as a check on the phenomenon observed in the first mode of analysis, and also enabled the association of educational attainment with whole sets of variables , such as those about parental education and attitudes , to be simply demonstrated and the two areas easily compared. In multiple regression, each of the variables correlated



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with the independent variable, i.e. educational attainment or Social Class, contributes toward the regression coefficient, so the inter-relations of educational attainment with various other indices of social stratification are signified by the regression coefficients.

As was noted in Chapter Two, the association of two variables does not mean the causation of one by the other. In dealing with the first two hypotheses, causation was only touched on when the differences between the two groups on variables associated with educational attainment; e.g. parental attitudes, were noted at the end of Chapter Seven. In Chapter Two, the influence of such variables on children's educational attainment was established with reference to other research. It was upon this established body of knowledge that differences in what are held to be important determinants of attainment between the two areas, were held to account for the differences in educational attainment between the two areas.

The third to sixth hypotheses investigated possible causations of the different levels of educational in the two areas. As such, they required more assumptions than the first two hypotheses.

Chapter Nine: the third hypothesis stated: "The different reasons given for moving to a New Town will indicate differences of attitudes and behaviour and hence attainment amongst the children of those moving."

This hypothesis assumed that the reasons given for moving to a New Town indicated differences of attitudes and behaviour and that these attitudes influenced the children's educational attainment.

The intent of this hypothesis was to determine whether or not the characteristics relevant to educational attainment of those attracted to the New Town were different from a comparison population. That the

New Town residents gave different reasons from those of the Constellation residents was first established with the chi squared test. The differences in attainment between the various groups defined by reason given was then established by t tests. After this , differences between the groups were established on the criteria of social class and on indicators of attitudes and behaviour, by both t tests and chi squared tests. Thus the reasons given for moving were shown to indicate both differences in attainment and also differences in attitudes and behaviour.

The corroboration of the hypothesis led to an investigation of possible antecedents of the association, of which Social Class was the most obvious. Although the different reasons given tended to indicate differences of Social Class , these class differences did not account for all of the differences in attitudes and behaviour also indicated. (this was demonstrated by controlling for Social Class as in Chapter Two). Earlier in the Chapter it was established that residents of the Constellation had moved for significantly different reasons from those of the New Town . It was necessary to establish whether or not those different reasons had accounted for the attainment of the New Town children. Acomparison of the scores of the children having moved for each different reason with those of the Constellation children was made (Table 9.2) and tested by t test , and the comparison was repeated controlling for Social Class to eliminate possible class bias (Table 9.5). The results of these comparisons were then supported by a comparison of the scores of those whose last move was inside Glenrothes with those of the Constellation sample (the distribution of reasons given by the two groups was not significantly different ; Table 9.1).

It was therefore established that not all the attainment advantages of the New Town children were accounted for by the different reasons for

moving and hence by the characteristics of the parents before moving , but that it was likely that some was so accounted. Upon establishing this it was necessary to determine the importance of reasons given for the last move in accounting for differences in educational attainment both with the Constellation and within the New Town itself. To this latter end an analysis of variance between reasons was carried out. In this way the importance of the indicator (i.e. reason for last move) could be determined and compared with other indicators such as Social Class , and also with the importance of the between towns difference (noted in Chapter Eleven). Three different methods were then used to determine the contribution of the differences in reasons given for the last move to the attainment differences between towns.

In this way an estimate was made of which of the models put forward in Chapter Three was most accurate , and an evaluation of one possible causation of the educational attainment differences made. This evaluation was continued in the following two chapters.

Chapter Ten

In this chapter , both the fourth and fifth hypotheses were dealt with. The fourth hypothesis stated : " Within similar social and economic circumstances, educational attainment will correlate with length of stay in the New Town."

Two indices of length of stay were used and they revealed contradictions when subjected to simple correlation (both parametric and non-parametric) with attainment scores. The investigation of these contradictions necessitated the breaking down of the sample into groups with different lengths of stay in the town, and the investigation of sampling and other biases, in order to determine the relationship of attainment with length of stay in the New Town. That the relationship was not one of simple correlation rendered investigations as to its significance difficult.

However the independence of the relationship from other possible determinants was established by several different techniques , such as partial correlation , chi squared and the control technique used in Chapter Seven. The importance of the time factor was established by analysis of variance between groups of different lengths of residence.

Hypothesis Five which stated : "The longer the residents have been in the town the smaller the differences in educational attainment between the Social Classes will be," evidenced similar contradictions between the two indices of length of stay and conclusions drawn from the evaluation of these two hypotheses lack the methodological rigor of the earlier conclusions. This was because the research design was created to cater for perceived probable relationships and in these cases did not anticipate the ones observed. It must also be noted that the sample sizes were very small for the use of the t test. An a posteriori explanation is necessarily inferior to one developing from the corroboration of a priori assumptions. However , as noted in Chapter Three, such a method is not always possible, and the explanations offered on these two topics are backed up by the other evaluations such as that relating to the Klineberg Hypothesis .

Chapter Eleven : In investigating the sixth hypothesis : "Educational attainment will be positively linked to both the age and the social structure of the precinct. ",it was necessary to evaluate the relative contributions of both neighbourhood and school variables to educational attainment to determine whether or not any linkage of attainment to precinct characteristics would be primarily through the school or through the neighbourhood . If the former, the reference of the hypothesis to the precincts would have been innacurate. This was done with use of non-parametric correlation techniques , because of the small sample size.

The hypothesis was then evaluated by correlation and partial correlation techniques.

Although the hypothesis was falsified ,significant neighbourhood and school differences emerged. The importance of these was evaluated by analysis of variance between and within schools and compared with the difference between and within the areas (i.e. Glenrothes and the Constellation) thus indicating the geographical variation in attainment inside and outside the New Town and setting other differences in this perspective.

Notes

- 1.Craddock,J.M., 'Statistics in the Computer Age' ,E.U.P. 1968, p.82.
- 2.Craddock,op.cit.,p.82.

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